Environmental Impact Statement

Rural Clean Water Program

As Authorized by: Section 208(j) of the Clean Water Act of 1977

Soil Conservation Service

United States Department of Agriculture

Washington, D.C.

SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
ENVIRONMENTAL IMPACT STATEMENT
RURAL CLEAN WATER PROGRAM (RCWP)

Abstract:

The Rural Clean Water Program (RCWP) provides financial assistance for implementing plans prepared under section 208(j) of PL 92-500, as amended by section 35 of PL 95-217, to control agricultural related nonpoint sources of pollution on private rural lands. Selected high priority areas will be eligible for special technical assistance and cost-sharing to rural land users applying best management practices to improve water quality. Participation in the program is voluntary. This statement analyzes alternative methods to administer the RCWP according to priority criteria. It demonstrates that program implementation would have extensive beneficial effects on the natural environment in applicable local areas and important indirect effects on human use of that environment. These effects are principally related to the reduction of nonpoint source pollutants originating from agriculture-related lands. Adverse environmental effects do not appear to be significant from a national viewpoint. Final program rules and regulations will be issued 30 days after the final environmental impact statement is made available to the public.

Norman A. Berg Acting for

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Soil Conservation Service
August 24, 1978

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SUMMARY OF ENVIRONMENTAL IMPACT STATEMENT

Introduction

The Clean Water Act of 1977 (PL 95-217) amends section 208 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) to provide for the establishment of a Rural Clean Water Program (RCWP). Section 208(j) directs the Secretary of Agriculture, with the concurrence of the Administrator, Environmental Protection Agency, and acting through the Soil Conservation Service and such other agencies as the Secretary may designate, to establish and administer a program to enter into contracts of not less than 5 years or more than 10 years with rural land owners and operators for the purpose of installing and maintaining best management practices (BMP's) to control agricultural nonpoint source (NPS) pollution for improved water quality. For purposes of this program rural lands are defined as privately owned agricultural lands including cropland, pastureland, forest land, rangeland, and other associated lands. Agricultural nonpoint sources of pollution means existing nonpoint sources that are (a) agriculturally related, including runoff from manure disposal areas and from land used for livestock and crop production, or (b) silviculturally related.

Program alternatives

Five broad alternatives for program development were analyzed. The alternatives were selected because of their probable implementation and capability for resource tradeoffs. It was assumed that funding level and strategies for selection of treatment areas were the most likely variables in the program because of the constraints of law and the expected content of the 208 plan. Major impact categories were selected and assumptions specified. The Second National Water Assessment carried out by the Water Resources Council and the linear program model for that assessment were used in developing broad quantitative guidelines relating land treatment to water quality. The analysis was then expanded to the full range of NPS pollutants and needed BMP's. The five broad alternatives are summarized as follows:

Alternative I - No program would be established, and no funds would be expended. This alternative would represent the "future without the program."

Alternative II - Sufficient expenditures (estimated at $8 to $15 billion) would be provided to adequately treat most significant nonpoint pollution sources on private rural lands. Approximately 64 million acres of NPS areas would be treated for sediment control in NPS areas containing about 162 million acres of cropland. In these and other areas, 100 million acres would be treated for pesticide and nutrient control, 10 million acres for animal waste control, and 12 million acres for salinity control.

Alternative III - An expenditure level at 20 percent of Alternative II would be provided and used for improving water quality in as many lakes and miles of stream as possible. Approximately 30 percent of the NPS areas treated in Alternative II would be addressed under this alternative.

Alternative IV - An expenditure level at 20 percent of Alternative II would be provided and used for concentrating treatment in areas contributing the greatest load of NPS pollutants to streams and lakes. Approximately 10 percent of areas treated in Alternative II would be addressed under this alternative.

Alternative V - An expenditure level at 20 percent of Alternative II would be provided and used for those priority projects with maximum potential for success because of project design and local interest. This alternative is the most probable choice for program direction because of administrative flexibility in selecting projects. Approximately 25 percent of the nonpoint source areas treated in Alternative II would be addressed under this alternative.

Affected environment

Streams and lakes of the United States cover approximately 50 million surface acres including 3.25 million miles of stream channels and over 45 million acres of lakes. It is estimated that sources of water pollution from agriculture adversely affect 67 percent of the river basins in the Nation. Principal pollutants include pesticides, dissolved solids, nutrients, sediment, organic material, and pathogens.

The primary source of most agriculture pollutants is cropland. There are approximately 363 million acres of cropland of which 65-75 million acres need conservation treatment for sediment reduction purposes, 100-125 million acres for pesticide management, 150-200 million acres for nutrient management, 10-15 million acres for animal waste control, and 12 million acres of irrigated land for salinity control. Typical soil losses from sheet and rill erosion on cropland ranges from less than 1 ton/acre/yr to more than 50 ton/acre/yr and averages 9 ton/acre/yr.

The potential for water pollution from grassland, and pastureland generally is attributed to three factors: sediment, livestock wastes, and chemicals. This potential, however, is normally less than that from cropland, although there will be certain local high priority source areas with these land uses that will be eligible for RCWP cost sharing. Rates of pollutant emission are usually greatest from lands improperly managed for intensive production of crops, livestock, or timber. Average annual erosion rates are about 10 percent of that on cropland.

Forest lands are also a source of agricultural pollutants. Typical pollutants derived from silvicultural activities include sediment, nutrients, pesticides, and organic material. Preliminary data from a 1978 erosion inventory conducted by the Soil Conservation Service indicates that there are 204 million acres of ungrazed forest land and an additional 42 million acres of grazed forest land, nonfederally owned, in need of some type of conservation treatment. This amounts to nearly 67 percent of all nonfederal forest land in need of conservation work. Some of the

identified needs are: 1 million acres of planting and seeding; 11,000 miles of road stabilization; and 5.4 million acres of stand improvement.

Private rural lands provide essential habitat for fish and wildlife. Private lands contain about 15 million acres of wetlands and 70 percent of all forest lands. The value of terrestrial wildlife habitats is substantially reduced by erosion, and fish and waterfowl habitat values are substantially reduced by excessive pesticides, nutrients, pathogens, organic material, and sediment delivered to lakes and streams.

Environmental consequences

1. The overall national consequences of failing to implement the RCWP (Alternative I) would be to accept an environmental future in which NPS pollution and the associated limitations of beneficial water use would be little improved, on a voluntary basis, from the present condition.

2. The overall national consequences of selecting Alternative II would be to substantially improve water quality in those areas predominantly affected by agricultural NPS pollutants from private rural lands and to cause important indirect benefits to human use of the environment. About 45 percent of the total NPS water pollution problem that originates on rural private lands would be addressed to meet national water quality goals under Alternative II through treatment of about 64 million acres for sediment reduction, 100 million acres for pesticide management, 150 million acres for nutrient management, 10 million acres for animal waste management and 12 million acres for salinity control. Irretrievable commitments of funds and a possible temporary loss of individual freedom of land use choices associated with ownership would be the principal expected adverse affects.

3. The overall national consequences of selecting Alternative III would be similar to the effects of Alternative II except that the improvements in water quality would be less extensive and would be confined to those lakes, streams, and ground water areas receiving water from selected project areas that can be effectively and most efficiently controlled. About 30 percent of the NPS water pollution problem considered in Alternative II would be addressed to meet national water quality goals under Alternative III.

4. The overall national consequences of selecting Alternative IV would be similar to the effects of Alternative II but confined to those surface and ground waters receiving water from areas that contribute high volumes of pollutants. Most of these areas would be expensive to treat. About 10 percent of the total NPS water pollution problem considered in Alternative II would be addressed to meet national water quality goals.

5. The overall national consequences of selecting Alternative V would be similar to the effects of Alternative II but confined to surface and ground waters receiving water from a combination of Alternative III and Alternative IV treatment areas. Approximately 25 percent of the total NPS water pollution problem considered in Alternative II would be addressed to meet national water quality goals.

6. A comparison of the effects of program alternatives on selected key impact categories as determined by the assessment team is presented in table 1.

Table 1.--Relative effects of program alternatives.
(Scale of -10 to +10; -10 most severe adverse effect, +10 most beneficial positive effect)

Impact Categories	Alt. I	Alt. II	Alt. III	Alt. IV	Alt. V
Water quality	-1	+6	+5	+2	+4
Land quality	-1	+5	+4	+2	+3
Erosion control	-1	+4	+3	+2	+3
Wildlife habitat	-2	+5	+4	+1	+3
Fish habitat	-1	+6	+4	+1	+4
Scenic quality	-1	+4	+2	+2	+2
RCWP expenditures	0	-10	-2	-2	-2

Possible areas of controversy

1. There may be years when converting land use to permanent cover under RCWP would conflict with perceived needs for increased agricultural production.

2. Strong economic incentive programs may be perceived by some individuals as conflicting with efforts to establish a voluntary basis for environmental stewardship.

3. Implementing the "208" plans will stimulate some controversy about resource allocation at local levels.

4. In irrigated areas in which BMP's would affect water conservation, controversy over the possible effects on waterfowl habitat and the responsibilities for mitigation of losses should be expected.

5. The relationship of the RCWP to other USDA programs may stimulate controversy. For example: How do incentives offered by the RCWP compete with or complement other program incentives? How can RCWP be cost effective where cost-sharing through other USDA programs has established certain cost share levels?

Major conclusions

1. Implementation of the RCWP under Alternatives II, III, IV, or V would have extensive beneficial effects on the natural environment in applicable local areas and important indirect benefits to people. Alternative V if the preferred alternative.

2. Using limited funds to improve as many units of surface and ground water as possible (as in Alternative III) would appear to benefit the greatest number of water users in the United States.

3. Concentrating treatment in high volume source areas (as in Alternative IV) would provide environmental benefits to fewer water users in and downstream from the areas selected for treatment. This alternative would improve fewer stream miles and acres of lakes than Alternatives II, III, and V.

4. The adverse effects, possible areas of controversy, and irretrievable commitment of resources appear to be either reasonable tradeoffs, remediable, or not highly significant from a national viewpoint except that:

   A. Alternatives II and IV might require a considerable amount of structural measures, such as terraces or debris basins, that might be controversial to landowners and might represent a significant irretrievable commitment of energy resources.

   B. Alternatives II and IV might require removing significant crop acreages from crop production, which might be controversial to local landowners.

C. Incentives under other USDA programs might compete and detract from RCWP incentives.

5. Because the relationship between BMP application and actual improvement in water quality is not entirely understood, there is much uncertainty over actual effects. More specific assessments of each RCWP project can reduce some of this uncertainty. Careful evaluation of current RCWP information efforts in the United States will also do much to improve the precision with which RCWP can be used to address the problem of NPS pollution.

6. Implementation of certain offsite or edge of the field BMP's may lead to controversy over the economics for improved water quality versus maintaining the soil resource base.

PURPOSE AND NEEDS

The Soil Conservation Service (SCS) proposes to implement policies, procedures, and regulations to carry out a Rural Clean Water Program (RCWP) in accordance with section 208(j) of PL 92-500, as amended by section 35 of PL-95-217 (33 U.S.C. 466 et seq.). The objective of the program is to aid in realizing national water quality goals through long-term contracts with rural land owners and operators for the purpose of installing and maintaining BMP's to control NPS pollution.

Only those states or areas that have an approved agricultural portion of a "208" plan qualify for cost-sharing for application of BMP's to control NPS pollution. To be eligible for financial assistance, a proposed RCWP project area must have documented agricultural NPS water quality problems. The agricultural portion of the "208" plan must:

- state that an adequate assessment has demonstrated that significant agriculture NPS problems exist.
- contain a list, in order of priority, of the most severe agriculture NPS problem areas.
- identify the BMP's to control the problems.
- designate a management agency to implement the agriculture portion of the "208" plan for which financial assistance is requested.
- include a schedule of implementation and provide for adequate resources to manage the program.

The agricultural NPS problem priorities and BMP's identified in the approved agricultural portion of the "208" plan determine the selection of project areas to be approved and BMP's to be cost-shared. The agriculture portion of a "208" plan is that portion of the 208 plan that deals with agriculture and those silvicultural activities related to farming and ranching enterprises.

ASSUMPTIONS

Program administration

The Secretary of Agriculture is to enter into agreements with soil conservation districts, state soil and water conservation agencies, or state water quality agencies to administer all or part of the program for a project area if practicable. If this is not practicable, the Secretary of Agriculture or his designee is to administer the program for a project area. If the Secretary of Agriculture or his designee administers the contracts for a project area, SCS is to enter into cooperative agreements to transfer funds to the Agriculture Stabilization and Conservation Service (ASCS). ASCS will allocate funds to ASC county committees, which will make cost-share payments to individuals.

On February 3, 1978, the Secretary of Agriculture outlined the organization for implementing RCWP and established a National Rural Clean Water Coordinating Committee, chaired by the Administrator, Soil Conservation Service (SCS). The National Rural Clean Water Coordinating Committee includes: Administrators of the Agricultural Stabilization and Conservation Service (ASCS), Farmers Home Administration (FmHA), Science and Education Administration (SEA), Economics, Statistics, and Cooperative Service (ESCS), the Chief of the Forest Service (FS), and the Assistant Administrator for Water and Hazardous Materials, Environmental Protection Agency (EPA).

A state Rural Clean Water Coordinating Committee is to be established in each state, Puerto Rico, and the U.S. Virgin Islands to implement the RCW Program. Each committee is to be chaired by the state conservationist, Soil Conservation Service. The state coordinating committee is to include the state "208" water quality agency, a designated representative of the areawide agencies, the state soil and water conservation agency, a designated representative of soil conservation districts, other state agencies as the governor deems appropriate, and representatives of the members of the National Rural Clean Water Coordinating Committee.

To insure that the most critical water quality problems are addressed, local soil conservation districts and the ASC county committees are to determine the priority of assistance among individual land owners or operators. The contracts are to be developed according to a plan approved by the soil conservation district, and the designated management agency must certify that BMP's to be cost-shared are consistent with the approved "208" plan.

Project areas

An RCWP project area is a hydrologically related unit (exceptions can be made for ease of administration, such as an entire farm unit) with critical water quality problems that result from agricultural activities. To be designated as an RCWP project area eligible for financial assistance, the area's water quality problems must be related to agricultural NPS's that yield unacceptable concentrations of nitrogen, phosphorus, dissolved solids, toxics (pesticides), bacteria, or sediment. Adverse effects on

water quality from agricultural activities result when water quality standards are violated or when beneficial water uses are impaired. These standards are defined in terms of the pollutants that prevent the attainment of water quality goals or degrade existing water quality.

An RCWP project area must be of manageable size to demonstrate, through adequate evaluation, the effect of the project on water quality within the contract period. Generally, the areas will be less than 200,000 acres. For this program rural lands are defined as privately owned agricultural lands including cropland, pastureland, forest land, rangeland, and other associated lands. Only those acres or sources of agricultural NPS pollutants significantly contributing to the water quality problems are eligible for cost-sharing assistance.

Adequate participation

The management agency designated by the governor to implement the agricultural portion of the "208" plan must insure an adequate level of participation before contracts are made. The level of participation is considered adequate if 75 percent of the critical acreage or source of the pollutant problem will be under contract. Exceptions are made for those areas in which the approved agricultural portion of the "208" plan provides data and analyses that indicate a different percentage of the acreage or source of the pollutant must be treated to attain water quality goals. In the RCWP project application, the designated management agency is to present a letter of commitment outlining the strategy for reaching an adequate level of participation.

Priorities

The governor or his designee is to recommend to the Secretary of Agriculture RCWP project areas for cost-share assistance in order of priority, according to priorities in the approved agricultural portion of the state "208" plan and in approved agricultural portions of the areawide "208" plan. Initially, only the highest priority RCWP project areas proposed in each state will be considered.

Funding for RCWP project areas will be determined according to the following criteria:

(1) Severity of the water quality problem caused by agricultural- and silvicultural-related pollutants, including:

(i) Use being made of the water,

(ii) Kinds and effects of pollutants, and

(iii) Miles of stream or acres of water bodies affected.

(2) Demonstration of public benefits from the project, including:

(i) Effects on human health,

(ii) Population benefited by improved water quality,

(iii) Effects on the natural environment, and

(iv) Additional beneficial uses of the water that results from improvement of the water quality.

(3) Social, economic, and technical feasibility to control the problems within the life of the project, such as:

(i) Cost effectiveness, including complementary impacts on land resources,

(ii) Size of the area and extent of measures incorporating BMP's needed, and

(iii) Cost per participant and cost per acre for solution of problem.

(4) State and local contributions in the project area, including:

(i) Funds for cost-sharing, technical, and administrative costs,

(ii) Commitment of local leadership to promote the program.

(5) The project area's contribution to meeting the national water quality goals set forth in the Federal Water Pollution Control Act, as amended.

Special efforts will be made to preserve, protect, and enhance wetlands within RCWP project areas as an incidental benefit or as a device to improve water quality in keeping with the President's Executive Order 11990 on Wetlands.

Practices cost-shared

Practices eligible for cost sharing are to incorporate BMP's identified in the approved agricultural portion of the "208" plan and are to be certified by the designated management agency as consistent with the approved plan. Measures incorporating BMP's to be cost shared must have a positive effect on water quality by (a) reducing the load of a pollutant from reaching the stream or (b) reducing the amount of the pollutant that is applied to the land. It is recognized that the plans on which the contracts are based may include conservation practices other than water quality related practices that are not eligible for cost sharing under this program. The installation of practices not related to water quality will not be required as a condition of participation in the program.

Cost-sharing assistance is not to be made available for:

- measures for which drainage is the primary purpose (subsurface drainage for irrigation water management may be eligible).

- measures for which flood protection (reservoirs or channel modification) is the main purpose.

- measures that result primarily in bringing additional land into crop production.

DESCRIPTION OF AFFECTED ENVIRONMENT

Water

General

Inland waters cover approximately 50 million surface acres of the United States. Of this area it is estimated that there are about 45 million acres of lakes larger than 40 acres in size. It is estimated that there are about 3.25 million miles of stream channel.

A fully definitive nationwide analysis of NPS water quality problems does not exist. However, estimates in EPA's draft National Water Quality Inventory, 1977 Report to Congress indicate NPS's are of significant concern.

According to the report, agricultural activities are the most widespread cause of NPS pollution significantly affecting over half the stream basins in each geographic region. The most significantly affected regions are the North Central, South Central, Southwest, the Hawaiian Islands, and Puerto Rico. In these regions 81 percent of the basins are affected, compared to 58 percent for the rest of the country. The national average of basins adversely affected by agriculture is 67 percent. Tables B-2 and B-3 of the appendix show, respectively, the percentage of basins affected by type of NPS and type of pollution problem. Figures 1 and 2 indicate the extent of basins in which surface water has been affected by pollution from nonpoint sources.

The amount of ground water and number and acreage of lakes significantly affected by NPS pollution is unknown. However, some form of ground water contamination as indicated in Figure 3 was reported by most regions in the Second National Water Assessment.

Nonpoint source loadings

Projections by the National Commission on Water Quality, based on a limited number of observations nationwide, indicate the extent of the water pollution problem facing the nation after point source problems are remedied. The commission estimated that:

- Of the total point and NPS loadings of 79,000 tons per day of suspended solids, NPS loads will account for 72,500 tons or 92 percent.

- Of the total daily nitrogen loading of 17,850 tons, NPS's will contribute 14,150 tons, or 79 percent.

- Of the 1,815 tons per day of phosphorus, NPS's will provide 965 tons or 53 percent.

- For both fecal and total coliform counts, NPS's will account for over 98 percent of the remaining national loadings.

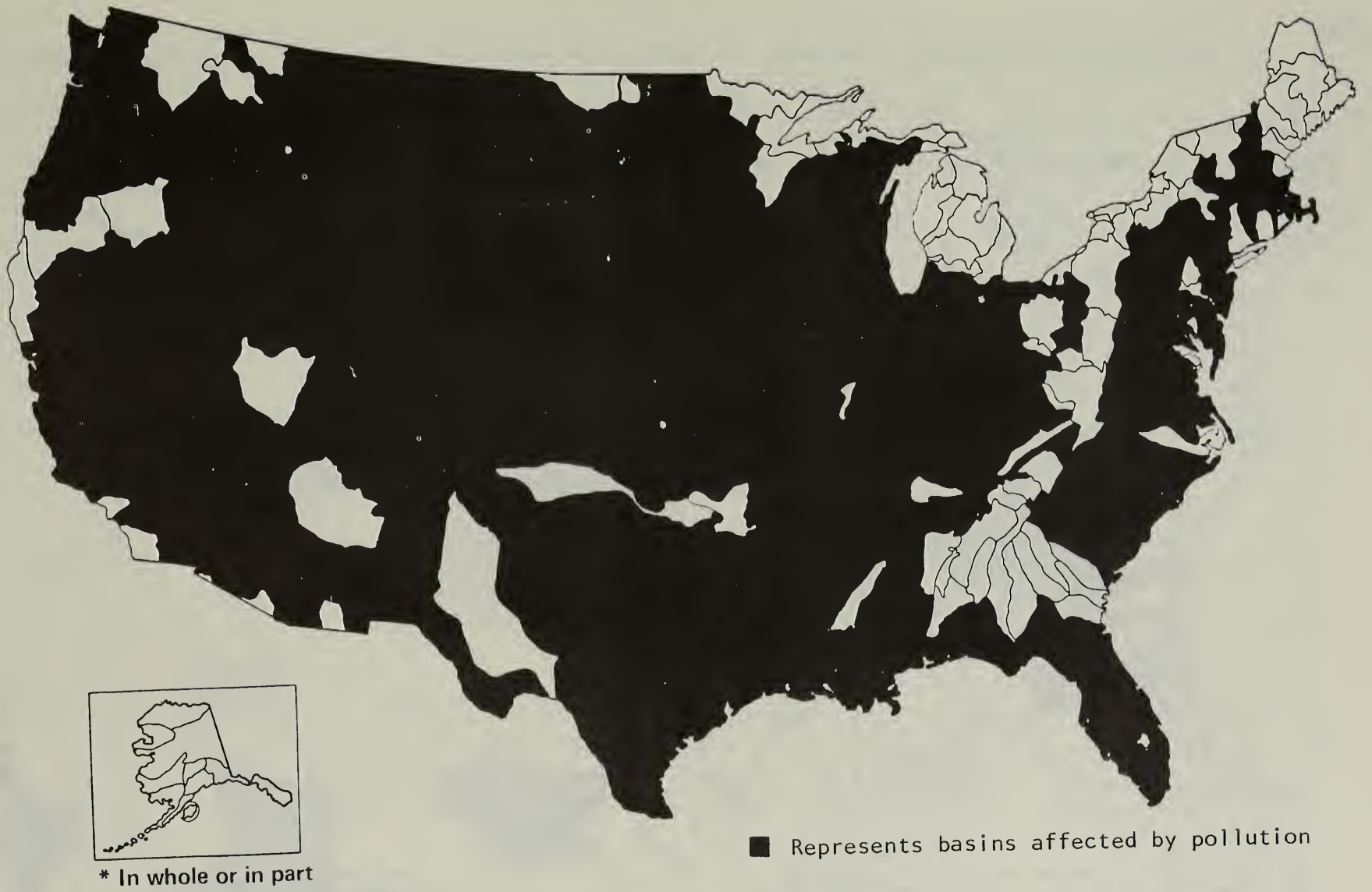


Figure 1 Basins affected by pollution from agricultural activities

Source: EPA. Unpublished draft, National Water Quality Inventory, 1977 Report to Congress

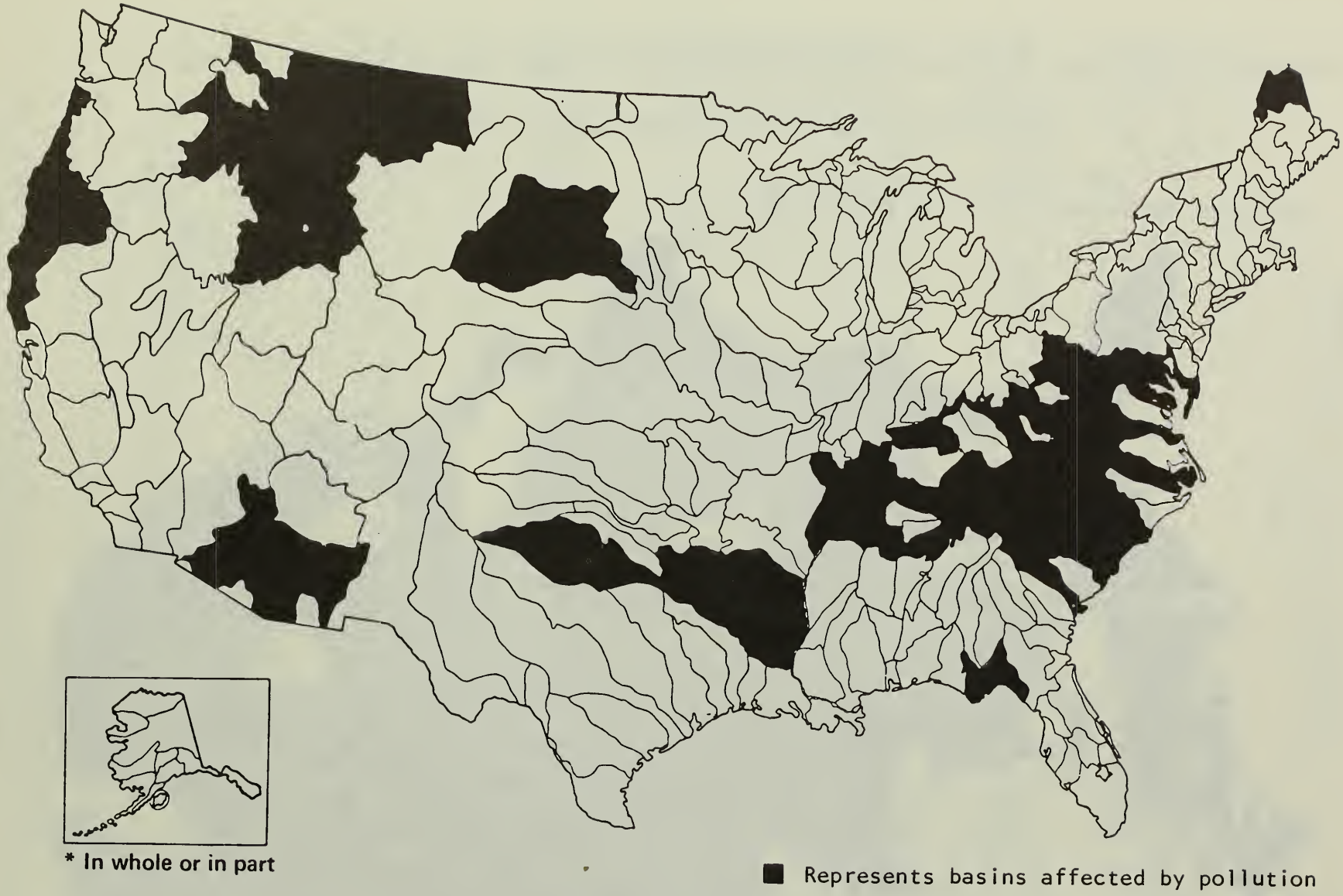
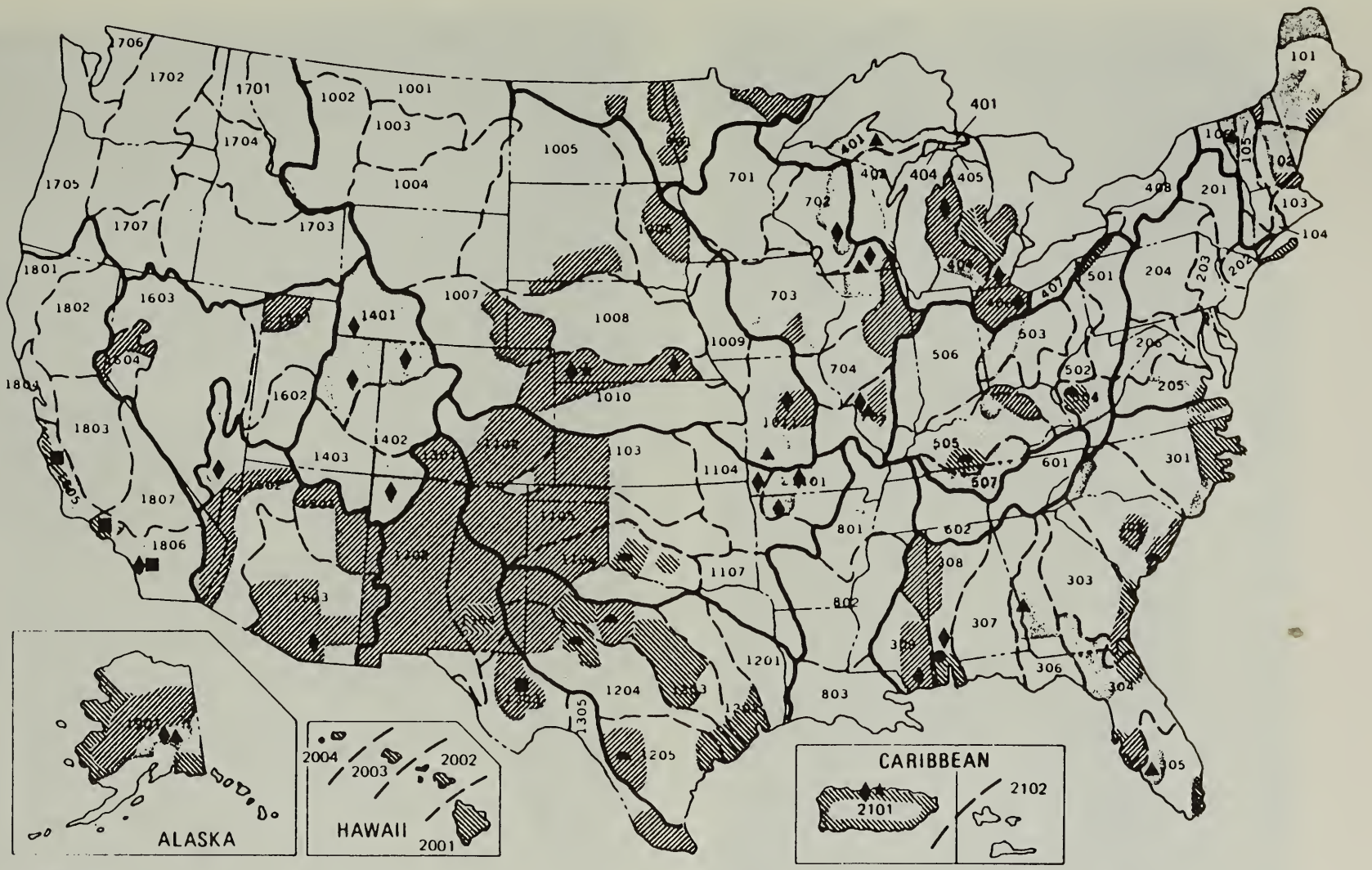


Figure 2 Basins affected by pollution from silvicultural activities

Source: EPA. Unpublished draft, National Water Quality Inventory, 1977 Report to Congress



Legend

Areas with Greatest Total Impact

- Areas that have ground water contamination.
- Areas with saline water intrusion (actual or potential) or natural salinity.
- Areas with high levels of minerals or dissolved solids in ground water.

Location of Specific Impacts

- ● Contamination resulting from leaching of municipal and industrial wastes and waste runoff through oil and gas fields and other excavations.
- ♦ Contamination resulting from toxic industrial wastes.
- ▲ Contamination resulting from leaching of wastes from land fills.
- ■ Salt and other chemical contamination of aquifers from irrigation and other agricultural activities.
- Inadvertent contamination from well drilling, harbor dredging, and excavation for drainage systems.
- ★ Contamination from deep well injection.
- √ Natural radioactivity in ground water.

Figure 3 - Groundwater Contamination

(Source: Second National Water Assessment)

These estimates reflect all NPS's including agriculture.

Agriculture NPS Pollutants.

Potential pollutants resulting from agricultural discharges include pesticides, nutrients, bacteria, organic material, sediment, and salts. Note Figures 4 thru 7.) Figures 8 thru 10 provide an indication of potential agricultural NPS areas based upon the intensity of a particular activity. Figure 11 indicates national extent of specific agricultural-related NPS pollutants.

Pesticides. Pesticide loadings originate from the more than 1,800 biologically active compounds sold in over 32,000 different formulations in the domestic market. The use of pesticides, particularly herbicides, to control crop pests has increased sharply in the last three decades and is still rising. In 1971, over 158 million acres of land were treated with herbicides, 65 million with insecticides, and 7.5 million acres with fungicides. Farmers accounted for the use of approximately 60 percent of the 750,000 tons produced in 1977.

Projections indicate that 1.25 millions tons will be used by 1985. Many investigations have found losses of various agricultural pesticides in runoff from treated land. Nearly all the investigations lead to the same general conclusions: except when heavy rainfall occurs directly after treatment, concentrations are very low, and the total amount of pesticide that runs off the land during the crop year is generally less than 5 percent. Nevertheless, some chemicals are highly toxic to fish or other aquatic forms and can persist in the aquatic environment for a long time so that even very low levels of these pesticides are of environmental concern.

Nutrients. Commercial fertilizers consumed during the fiscal year ending June 30, 1976, amounted to about 49 million tons in the United States. These fertilizers contained roughly 20 percent nitrogen, 5.2 percent phosphorus, and 8.8 percent potassium. Agricultural residues of nitrogen and phosphorus may enter surface and ground waters from runoff and leaching losses associated with animal wastes, commercial fertilizer, and crop residuals and from movement of sediments associated nutrients into surface waters. Estimates of total nitrogen contributed to the Nation's waters varies from 750,000 tons to 7.5 million tons per year from rural agricultural land. Total phosphorus loading is estimated at 60,000 to 600,000 tons per year from rural agricultural lands.

The total amount of nitrogen and phosphorus lost to surface and groundwater depends on a number of variables. For cropland these variables include application rates, soil properties, terrain, crop management practices, and rainfall amounts. Many experiments have determined the amount of nitrogen and phosphorus lost to waters in individual agricultural situations. The estimates of total applied nitrogen that reaches surface waters varies from 15 to 54 percent. Ranges of total applied nutrients to surface waters are 0.03 to 8.4 pounds per acre for nitrogen and 0.01 to 0.08 pounds per acre for phosphorus.

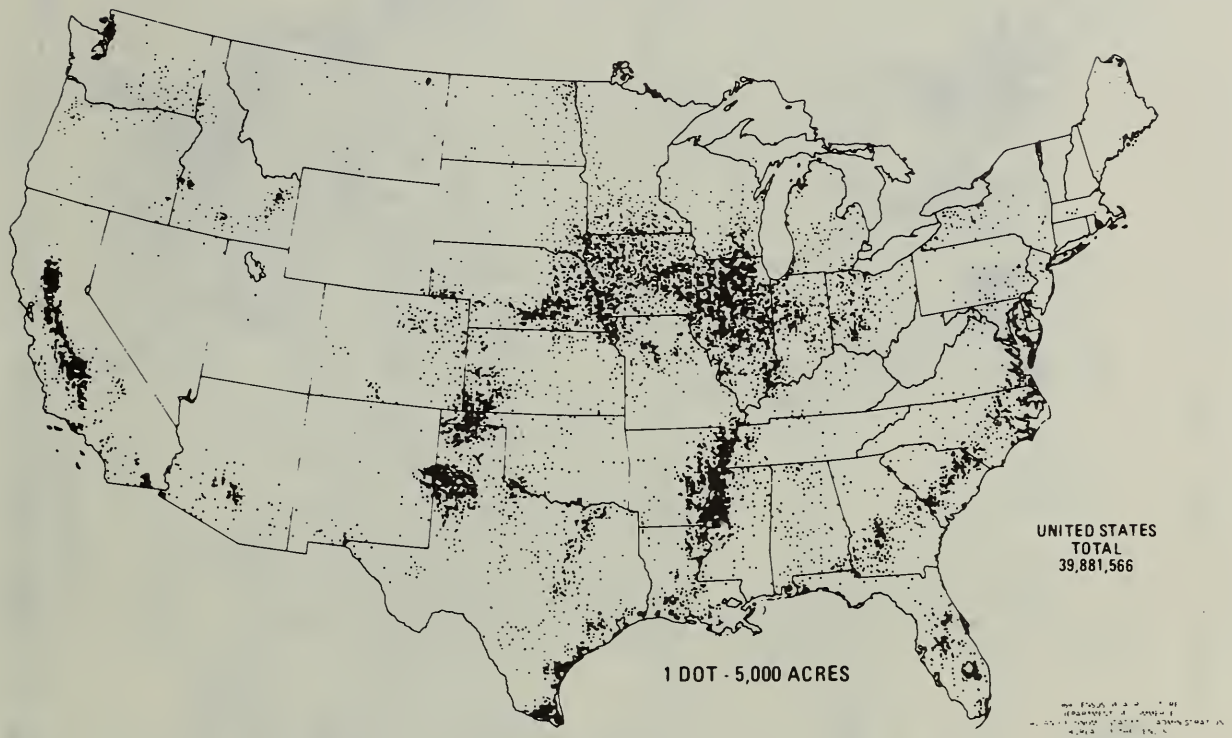
Figure 4.--Agricultural nonpoint sources

Figure 5.--Results of poor pesticide use

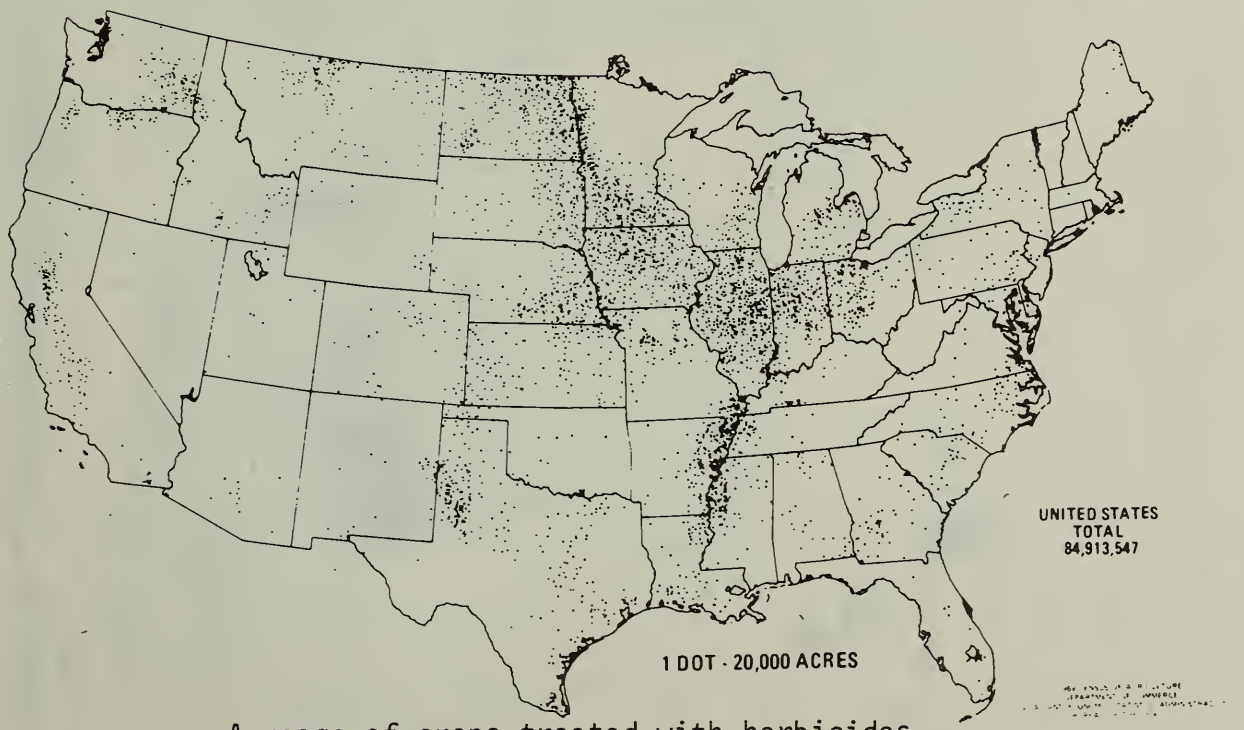
Figure 6.--Feedlot and pasture runoff

Figure 7.--Soil from cropland deposited in a stream

Figure 8 Cropland treated with pesticides and herbicides: 1969



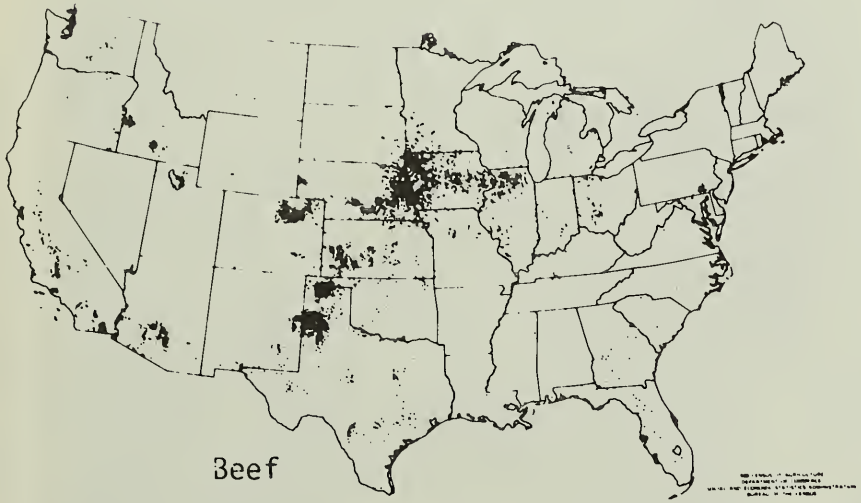
Acreage of non-hay crops treated with insecticides



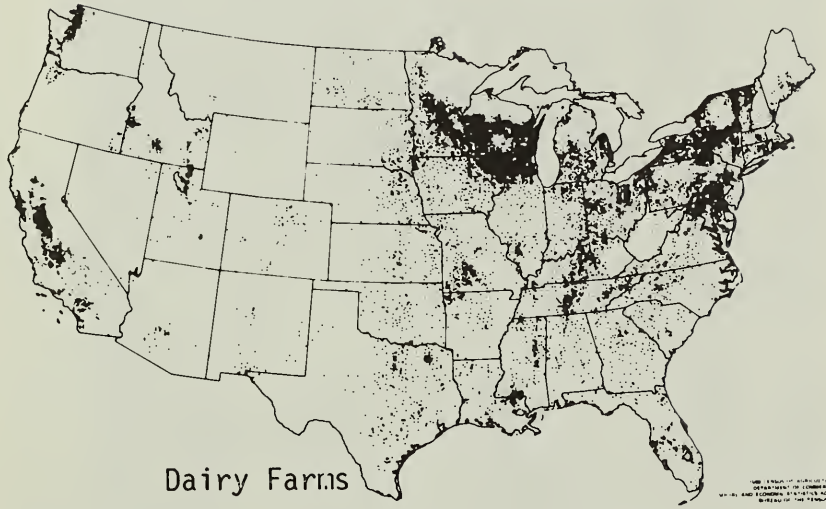
Acreage of crops treated with herbicides

Source: Control of Water Pollution from Cropland. Volume I. USDA, EPA. 1975.

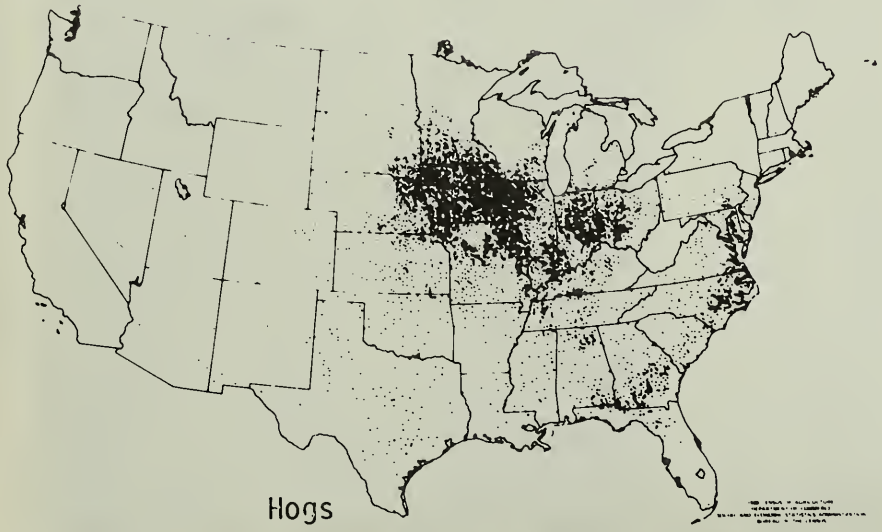
Figure 9 Concentrations of feedlots



Beef



Dairy Farms

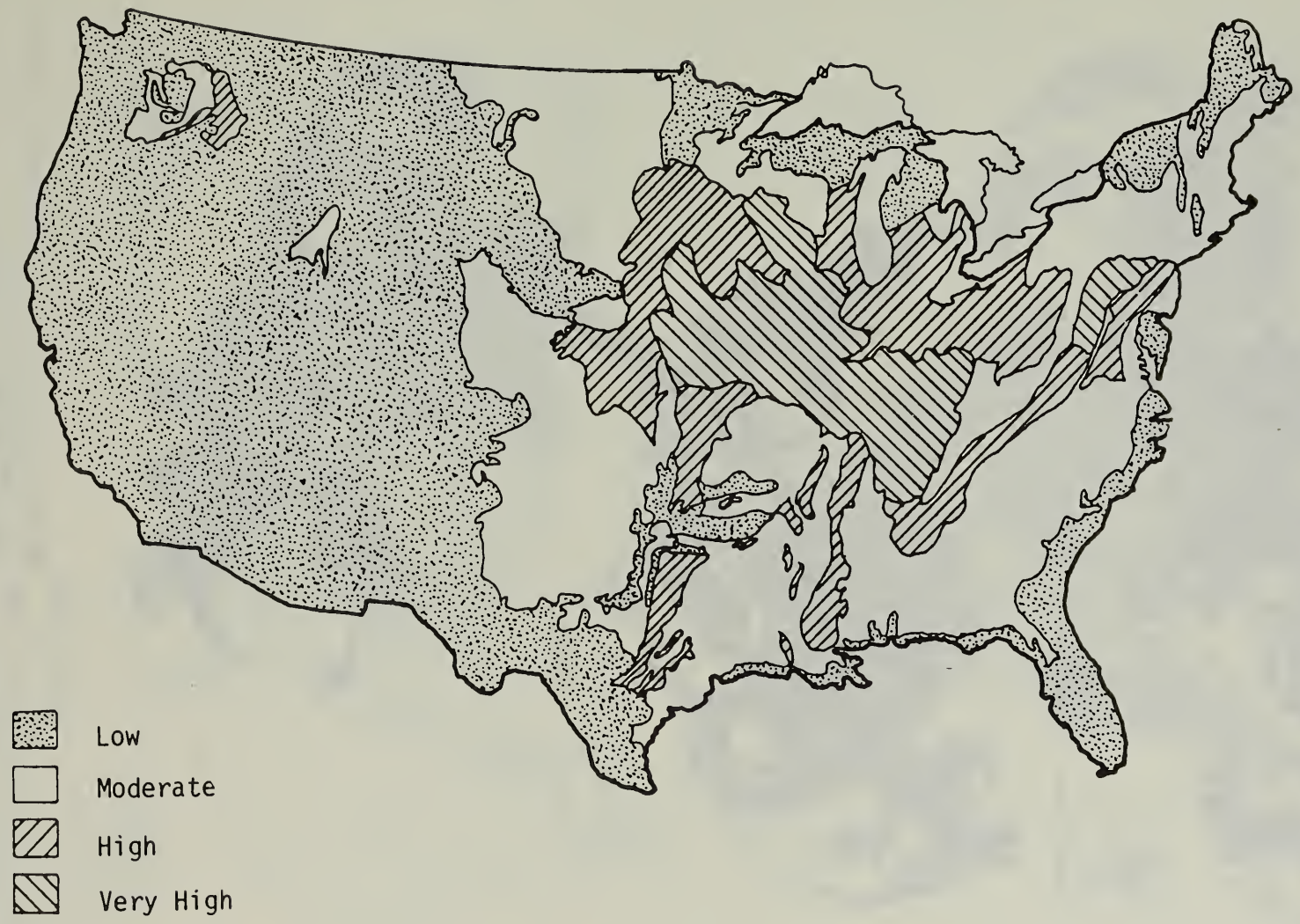


Hogs

Chickens

Source: Control of Water Pollution from Cropland. Volume I. USDA, EPA. 1975

Figure 10 Relative potential contribution of cropland to watershed sediment yields.



Source: Control of Water Pollution from Cropland. Volumel. USDA, EPA. 1975

* In whole or in part

Suspended Solids

* In whole or in part

Bacteria

Pesticides

■ Represents basins affected by specific pollutant

Figure 11 Extent of Specific Nonpoint Source Pollutants

Source: EPA. Unpublished draft, National Water Quality Inventory, 1977 Report to Congress

Nutrients

Total Dissolved Solids

■ Represents basins affected by specific pollutant

Figure 11 (continued) - Extent of Specific Nonpoint Source Pollutants

Source: EPA. Unpublished draft, National Water Quality Inventory, 1977 Report to Congress

Runoff and leaching losses of nutrients occur from animal wastes in confined units, as well as from waste disposed on land. The extent of this loss varies by geographic area, size and type of animal unit, and type of waste disposal system used. Closed confined housing of animals minimizes potential pollution if wastes are properly disposed. Feedlots present the most severe potential pollution. In localized areas, fish farming activities may contribute significant amounts of nutrients to receiving waters.

From a national viewpoint, the actual effect on water quality of each nutrient source is difficult to assess because of the complexity and interaction of numerous variables.

Livestock wastes. There are 2 billion tons of livestock wastes produced annually. Unconfined operations use about 40 percent of the U.S. land area and produce about 50 percent of all livestock wastes. Unconfined animal production when not properly managed, can cause changes in vegetative cover and soil physical properties that may result in increased rainfall runoff and transport of pollutants to contiguous surface waters. The most common water quality change is elevated counts of indicator bacteria. Increased levels of inorganic and organic sediments with associated plant nutrients and oxygen demanding material may also result from certain high impact or problem areas where inadequate management and/or poor site conditions exist.

Prediction of increases in water pollution because of unconfined animal production is not possible with present technology.

Sediment. The total sediment delivered from cropland to streams and lakes is about half of the sediment delivered from various sources as indicated in table 2. Deposited into water bodies, sediment can cover fish spawning areas, clog channels of rivers, fill lakes, reduce light transmission in water, and carry adsorbed pesticides and nutrients. The fine-grained fractions of sediment and organic matter are of particular concern because of their affinity and/or association with available pesticides and nutrients, susceptibility to the erosion processes, and inherent ability to pass through many of the applied erosion and sediment control measures.

The potential contribution to sediment in stream flow depends on the erosion rates, the sediment delivery ratios, and vegetative density.

Table 2.--Estimated percent of sediment yield by source.

Sediment source	Contribution (percent)
Streambank	26
Cropland	40
Pasture and range land	12
Forest lands	7
Roadside	3
Urban	4
Mining	1
Other	7
Total	100

Salinity. In the United States, agricultural irrigation is practiced on approximately 44,000,000 acres, which represents about 12 percent of the cropland and provides about 25 percent of the total U.S. crop value. About 90 percent of the irrigated land in the United States is in the 17 Western states. The effect of agricultural irrigation on water quality has only been recognized in recent years. The most significant water quality problem with respect to irrigated agriculture is high salinity levels. However, other pollutants such as pesticides, nutrients, and sediment also contribute to degrading water quality as a result of agricultural irrigation. Increased salinity from irrigation is primarily caused by return flows (both surface and subsurface), evaporation, and transpiration. Salinity is not easily reduced because a high percentage of salt loading comes from natural sources. However, water conservation practices that reduce seepage and deep percolation from irrigation and reduce incidental consumptive losses can significantly reduce salt loading. Present technology includes improved farm water delivery systems, onsite irrigation water management, improved application systems, and improved return flow management.

Water erosion contributes significantly to salt loading in western streams because significant amounts of minerals or salts are leached from the saline soils. Erosion on diffuse source areas of soil or geologic strata with high salt content, such as shales and lakebed deposits, results in large contributions of salt that degrade stream water quality. According to the USDA-SCS report 'Erosion, Sediment, and Related Salt Problems and Treatment Opportunities,' erosion produces a portion of the 90 to 100 million tons of salt yield annually, which degrade the water supplies in the 11 Western states. Salinity is significant in about 20 percent of the soils in the Western states and application of an erosion control program in these areas will result in a salt load reduction in excess of 2 million tons per year.

The total damages attributable to salinity in the Colorado River system for 1973 are about $53 million. By the year 2000, these damages upon the total regional economy are expected to reach about $124 million per year if no control measures are applied. This is shown by recent studies by the Bureau of Reclamation, which estimated total direct and indirect economic losses of about $230,000 per mg/l increase in salinity at Imperial Dam.

Land

The total land area in the 50 states of this country is 2.264 billion acres. Land use in 1975 is indicated in table 3.

Private rural land consists of 2.7 million operating units with an average size of 393 acres. About 1 billion acres of private rural land are contained within the Nation's 2,942 soil conservation districts. About 4 percent of the estimated 212 million U.S. population live in rural areas.

Table 3.--Land use in the United States (1975).

Land use	Acres (millions)
Urban & other	297
Nonirrigated cropland	319
Irrigated cropland	44
Pasture & range	886
Forest & woodland	718
Total land	2,264
Total water	50

Source: U.S. Water Resources Council, 1975 National Water Assessment

Soil loss from sheet and rill erosion on cropland varies from less than 1 ton/acre/yr to greater than 50 ton/acre/yr and averages 9 ton/acre/yr. On range and forest lands sheet and rill erosion averages 0.9 ton/acre/yr.

The potential for water pollution from grassland, and pastureland generally is attributed to three factors: sediment, livestock wastes, and chemicals. This potential, however, is normally less than that from cropland, although there will be certain local high priority source areas with these land uses that will be eligible for RCWP cost sharing. Rates of pollutant emission are usually greatest from lands improperly managed for intensive production of crops, livestock, or timber. Average annual erosion rates are about 10 percent of that on cropland.

Forest lands are also a source of agricultural pollutants. Typical pollutants derived from silvicultural activities include sediment, nutrients, pesticides, and organic material. Preliminary data from a 1978 erosion inventory conducted by the Soil Conservation Service indicates that there are 204 million acres of ungrazed forest land and an additional 42 million acres of grazed forest land, nonfederally owned, in need of some type of conservation treatment. This amounts to nearly 67 percent of all nonfederal forest land in need of conservation work. Some of the identified needs are: 1 million acres of planting and seeding; 11,000 miles of road stabilization; and 5.4 million acres of stand improvement.

The combined soil loss from geologic erosion and man-accelerated erosion is estimated to be about 4 billion tons per year. Estimates of relative erosion are given in table 4.

Table 4.--Relative total erosion from various land uses.

Land use	Index (Native pasture (equals 1)
Abandoned surface mines	< 1
Native Pasture	1
Pastureland	3
Private forest land	6
Rangeland	8
Cropland	23

Source: Derived from preliminary estimates of the 1977 SCS National Erosion Inventory.

Air

The air in rural areas of the United States is generally of high quality. There are localized problems in rural areas near industrial concentrations and metropolitan areas. Soil blown from inadequately protected cultivated fields and deteriorated rangeland significantly reduces air quality. Susceptibility to wind erosion is the dominant problem on 55 million acres of cropland. Some local odor problems arise from improper animal waste management. Drift and volatilization from some pesticide application techniques can result in up to 40 percent loss of the pesticide and can cause deterioration in air quality.

Fish and wildlife habitat

Private rural lands in the United States provide vitally important habitat for the Nation's fish and wildlife. Private rural lands contain about 15 million acres of wetlands and 70 percent of all forest land. The 20 percent of the United States that is cropland provides important habitat components for many species of wildlife. Privately held forest lands exceed 800 million acres, comprising 70 percent of all U.S. forest lands. Together these lands provide habitat for a major share of the wildlife produced in the United States. These same lands profoundly influence fish habitats in downstream surface waters.

An estimated 29 percent of the Nation's perennial streams are judged to have fish habitat quality that is impaired to some degree by NPS pollutants. A substantial portion of those NPS pollutants originate from private rural lands. It is unknown what amount of the Nation's wetlands are affected by NPS pollutants.

There is little quantitative information about total national habitat values for wildlife on private rural lands. From a qualitative viewpoint, it is known that habitat values are substantially reduced by erosion and by excessive uniformity of cover types.

There is also little quantitative information about total national habitat values for fish or the effect of NPS pollutants on those values. Qualitatively, it is widely accepted that fish habitat values are substantially reduced when excessive sediment and other NPS pollutants are delivered to lakes and streams. Fish populations can be directly damaged by excessive levels of pesticide, sediment, and salts and indirectly affected by high biochemical oxygen demand or nutrient levels.

Detailed evaluations of the potential impacts of the RCWP on fishery and wildlife resources, including wetlands, can only practically be done on a site specific basis recognizing individual species of wildlife, specific land and water conditions, and specific mix of BMP's. Such evaluations will be done, as needed, to define fishery and wildlife impacts on a case by case basis in individual RCWP project areas.

Climate

The climate ranges from subtropical in Southern California and Florida to temperate conditions along the border with Canada. Annual precipitation

in the United States ranges from 8 to 120 inches or less in the Western states, 16 to 50 inches in the Midwestern states, and 40 to 50 inches in the Eastern states. Climatic factors such as rainfall significantly influence the magnitude of NPS effects on water quality as well as the type of best management practices to be used.

Scenic resources

The scenic quality of land and water in private rural areas varies greatly. Although there are no widely accepted quantitative systems for evaluating scenic quality, meaningful qualitative statements can be made. The primary scenic quality problems in private rural areas include eroded landscapes, areas of monotonous cover types, abandoned farmland, visible inadequately treated organic wastes, turbid surface waters, floating debris and trash, and excessive growths of aquatic plants and algae.

Energy

Agricultural production consumes about 3 percent of the total energy used in the United States. The current high level of energy prices is encouraging energy conservation, adoption of alternative renewable energy sources and more research for different energy sources. The production of nitrogen fertilizer is the single largest use of energy in to agricultural production in nonirrigated areas.

ALTERNATIVES

General

Five alternative strategies have been compared in this statement. Alternative I assumes that there will be no funding for the RCWP; Alternative II assumes that enough funding will be available to solve most of the rural nonpoint source pollution problems. The other three alternatives assume a lower level of funding than Alternative II and are characterized by emphasis on (a) impact on water quality of adopting best management practices (BMP's), (b) severity of water quality problems, and (c) probability of project implementation. Of the alternatives with limited funding, Alternative III would result in the greatest improvement in water quality by adopting practices over a fairly large geographic area but would not address some of the very worst water quality problems because of the high expense of their solutions. Alternative IV proposes to address the worst problems, but would be limited in its geographic coverage. Alternative V, the preferred alternative, is a combination of Alternatives III and IV that allows greater flexibility so that not only the physical considerations of problem severity and likely impact of control or water quality are considered, but also the probability of project implementation because of local interest.

Alternative I

Alternative I provides a future projection that can be used to evaluate the other alternatives. This alternative assumes that there would be no RCWP funding, but that existing conservation and management programs on private rural agricultural lands would continue.

Alternative II

This alternative represents the maximum practical improvement in water quality that could be expected from treatment of private rural agricultural lands. It would require an expenditure of $8 to $15 billion. This program alternative assumes that there would be sufficient Federal and local expenditures, including maximum program participation, for adequate treatment of NPS pollution on private rural agricultural lands.

To adequately control future NPS pollution, proper land and source management and treatment are required. Management and treatment include the effective use of vegetative residues and plant canopies as ground cover. Additional treatment to complement plant cover include runoff interceptors, terraces, diversions, contour farming, and offsite treatment.

Source management includes integrated pest management and management of fertilizer rates and application techniques. These practices may be grouped into: (1) practices that are primarily for control of source detachment (rainfall energy) or transport (runoff); (2) management of source availability of fertilizer, animal wastes, and pesticides; and (3) management of irrigation water.

Reduced levels of pesticide use coupled with approved rates and application techniques are assumed to reduce pesticide water quality problems. Integrated pest management would be a primary technique for control. USDA Extension Service estimates that over 100 million acres of cropland could effectively incorporate integrated pest management. Use of approved management techniques for pesticide container disposal, application rates, and timing would also be used under Alternative II.

For nutrient control, the magnitude of the cropland acreage and animal waste units requiring treatment and management is unknown. However, the control techniques include proper management of fertilizer and manure applications and applicable conservation measures that reduce the amount of nutrients delivered to water.

The quantity of oxygen depletion material and bacteria from animal waste requiring treatment is unknown because many variables influence delivery to the stream and create limitations of this program. According to the Report of the National Commission on Water Quality, over one million feedlots for various animals were of concern with respect to water quality. This program will be restricted to nonpoint waste sources derived from animal operations.

Alternative II assumes that sediment from cropland can be controlled by adequately treating that acreage needing erosion control and having a relatively high delivery ratio of sediment to water bodies. The extent and intensity of resource management and land treatment to reduce sediment yield that would be required to move from present conditions to the year 2000 was based on the modified central case used for the Second National Water Assessment. In total, 64 million acres of cropland would require treatment for erosion and sediment control. BMP's to reduce salinity would be applied on approximately 12 million acres.

Alternative III

The objective of Alternative III is to improve water quality in as many stream miles and lakes as possible with a limited program expenditure of approximately 20 percent of Alternative II. This alternative will treat approximately 30 percent of the problem areas considered in Alternative II. Fund allocation and selection within "208" planning areas would address those NPS pollutants that affect the greatest amount of surface waters, and those areas that have the greatest probability, technically, of improving water quality. Some areas with high NPS loadings to stream may not be addressed by this alternative if (1) the cost of control is very expensive or (2) the technical probability of improving water quality a significant amount is very low.

Alternative IV

The objective of Alternative IV is to improve water quality by concentrating treatment in project areas that have severe NPS water quality problems with the same expenditure as Alternative III. This alternative will treat approximately 10-15 percent of the problem areas considered in Alternative II. Selection within "208" areas and fund allocation would

depend on the severity of NPS pollutants produced from a large proportion of the stream or lake drainage area, and require a relatively high expenditure for their control. The alternative would generally address those streams and lakes that receive a high loading of NPS pollutants. Extensive BMP installation would be required to meet the national water quality goals with a corresponding large expenditure per stream mile improved. The technical probability of improving water quality would be less than Alternative III.

Alternative V

This alternative reflects preferred program direction. It allows for a broader eligibility of project areas than Alternatives III or IV. For national program administration, this alternative gives the necessary flexibility to select project areas that have the highest potential of success because of project analysis and design and local desire for implementation. At the 20 percent level of expenditure, this alternative would treat 25 to 30 percent of nonpoint sources treated in Alternative II.

For the environmental impact analysis, program expenditures would be 70 percent of Alternative III and 30 percent of Alternative IV. Alternative V would include the appropriate combination of BMP's to adequately address problems considered in Alternatives III and IV.

ENVIRONMENTAL CONSEQUENCES

General

The potential environmental effects of pollutants from agriculture and silviculture often cannot be directly or separately assessed. Various other sources of pollutants may be intermingled within common environmental receptors--streams, rivers, lakes, and airsheds; consequently, synergistic pollutant effects and associated environmental implications may result.

As an aid in assessing the potential environmental implications of alternatives, a schematic relationship of agriculture and silviculture to their sources of pollution and their linkage to a common environment is shown in Figure 12. Within this framework, the ultimate uses of environmental resources (water, air, and land) are shown to be the main determinants of the environmental implications of concern, because of, effect of pollutants on subsequent uses of the resources.

To select the most appropriate BMP, basic information is necessary to outline the physical, climatological, and managerial conditions under which NPS pollution occurs. Additionally, it must be recognized that the relationships between BMP's and water quality are not fully understood.

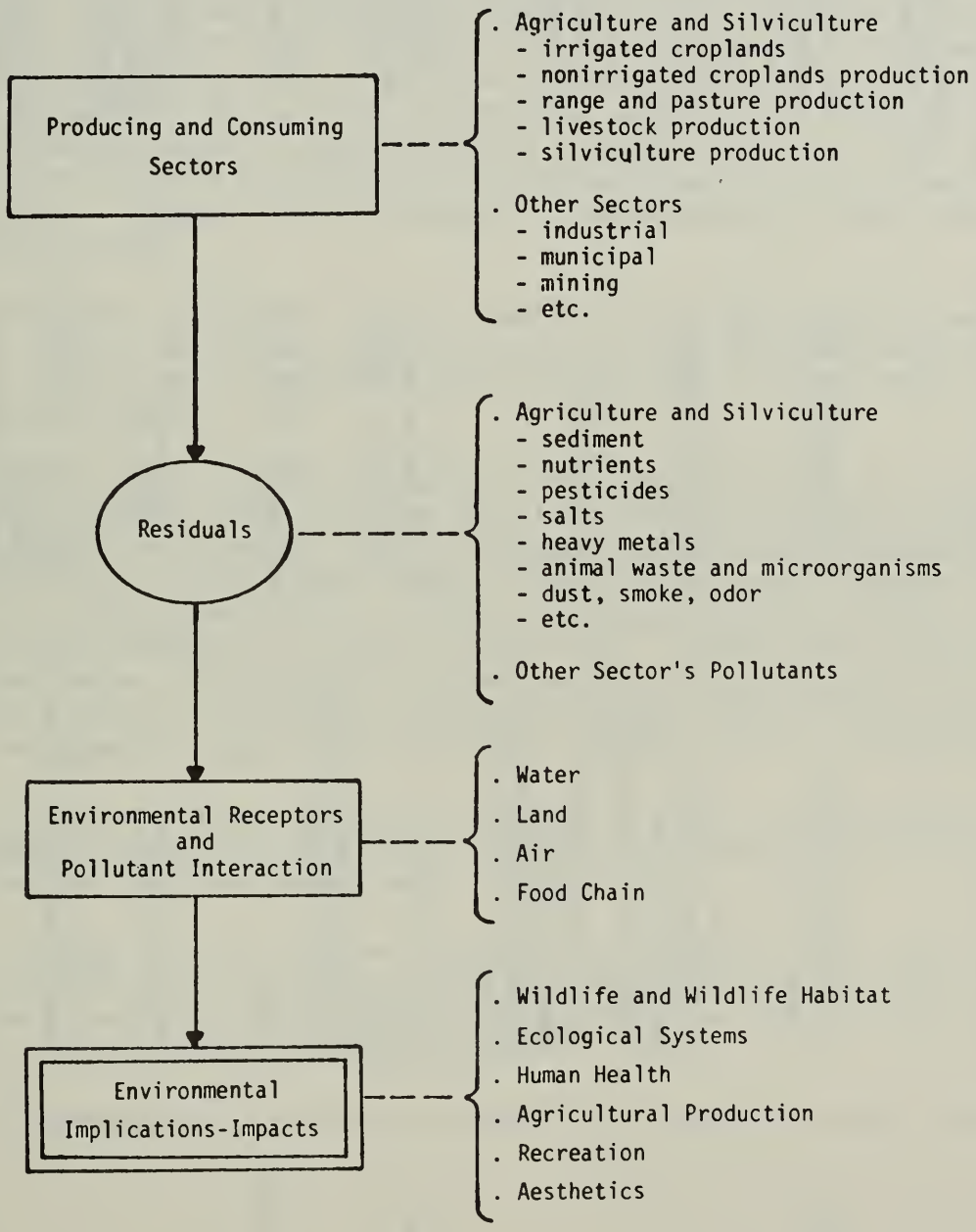
Important interrelationships exist that may affect the choice of a particular practice in an area. For example, the introduction of a conservation tillage practice to control erosion and sediment may result in the use of greater amounts of chemicals to control crop pests so that the net benefit to water quality of receiving streams may not be as great as expected in local areas. On the other hand, stripcropping might reduce the need for pesticides because of crop rotation and tillage practices.

Additionally, full benefit must be given to the role of "natural systems" in improving and maintaining water quality.

Information on single water quality problems was used in this analysis, such as geographic location of water pollution from pesticides, salinity, nutrients, sediment, and animal waste. In some streams, lakes, or ground water aquifers more than one pollutant type is present. Control of even one pollutant often requires that a combination of practices be adopted. Certainly when more than one pollutant is to be controlled, a project that includes a number of coordinated practices (resource management systems) will be necessary.

Because no single practice is best for all water pollutants, or even in all cases, practices must be categorized by type so that emphasis can be given certain types of practices for the control of particular categories of pollutants. Practices can be categorized by source control or detachment and transport control. Pollutants can be categorized by their mode of movement from the land to the water they contaminate. Table 5 lists examples of some potential pollutants according to their movement as associated with water or soil. Substance persistence, transformation, and solubility are also important considerations in categorizing pollutant types.

Figure 12 A flow diagram of sources of environmental pollution and their implications



Source EPA. Environmental Implications of Trends in Agriculture and Silviculture Volume 1: Trend Identification and Evaluation, 1977

Table 5.--Pollutant availability, solubility/absorption characteristics, and likely pathways to aquatic environment

Pollutant	Availability	Solubility/absorption	Likely pathways
Sediment:			-soil erosion -streambank erosion
Nitrogen:			
particulate organic	soil mineralization manure disposal	-in suspension or absorbed to soil	-carried in overland flow and soil erosion (similar to soil erosion process)
ammonium	air rainfall soil mineralization manure disposal fertilizer applications	-strongly absorbed to soil	-soil erosion and snowmelt
nitrate	soil mineralization manure disposal fertilizer applications rainfall	-in solution	-surface flow -subsurface flow
Phosphorus:			
dissolved inorganic	plant residue soil manure disposal fertilizer applications	-in solution and absorbed to soil	-overland flow and soil erosion
particulate inorganic and organic	-soil	-strongly absorbed	-soil erosion
Manure:			
organic matter	-manure disposal	-in suspension	-carried in overland flow similar to soil erosion process)
Pesticides:	-pesticide application	-most are moderately absorbed some are strongly adsorbed	-overland flow and soil erosion
Dissolved solids	-soil mineralization	-in solution	-subsurface and overland flow

Appropriate emphasis is important in program development. Certain types of practices are emphasized for the control of particular types of pollutants. In some instances, generalized solutions are not the most appropriate. Each individual water quality problem must be evaluated in its own setting and a unique solution designed for it. But for an overall environmental assessment the general rationale assumes that emphasis will be placed on matching the pollutant with the solution. For example, some soluble pollutants such as nitrate-nitrogen from fertilizer application require emphasis on source control. The control would likely depend heavily on an extensive educational program emphasizing nitrogen management (e.g., rate, timing, and application technique). Other pollutants, such as sediment, need transport control. Such projects would require technical assistance in land management or structural installations. Figure 13 is a schematic representation of the process for determining BMP.

Source management generally requires emphasis on comprehensive educational programs. Land management or structural practices for detachment and transport control will complement the existing USDA soil and water conservation program.

The potential effect of RCWP on ground water is considered site specific. Application of BMP's that increase infiltration could increase ground water recharges. If the increased recharge encounters and transports pollutants in the soil, ground water pollution may occur. The pollution could deteriorate ground water locally and adversely affect wells. If polluted water emerged in streams as base flow, surface water quality would deteriorate. The linkage between surface and groundwater is physically complex. For this statement, program effects on ground water quality and quantity were considered very limited for all alternatives.

Careful assessment of the hydrologic system as a part of the project environmental assessment will aid in limiting any adverse effects that the program may have on ground water quality.

Tables 6 through 10 were used as a guide in developing qualitative ratings for BMP effect on water quality. Complete control of NPS pollution from private rural lands was not anticipated because of technical, economic, and implementation limitations.

Figures 14 through 16 illustrate some BMP's for nonpoint source control.

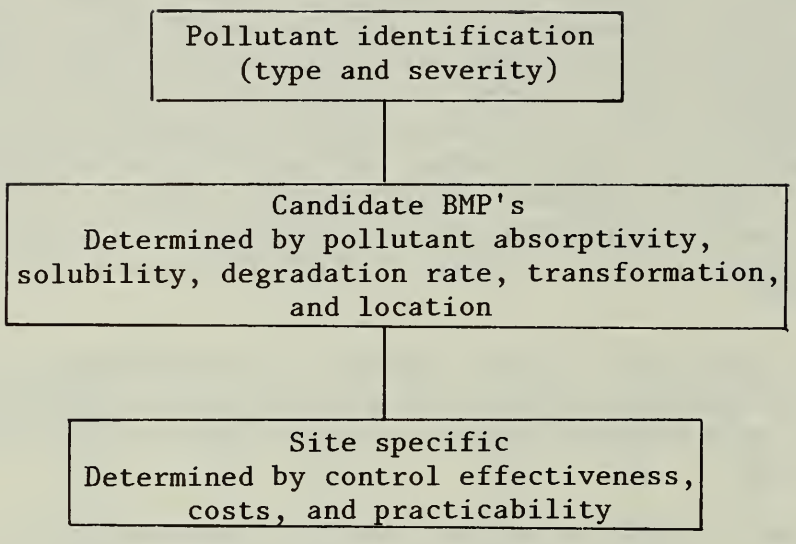


Figure 13.--Schematic representation of BMP selection

Table 6.--Management practices for reducing pesticide loss from agricultural applications.

No.	Pesticide Control Practice	Practice Highlights
P 1	Using alternative pesticides	Applicable to all field crops, rangelands and woodlands; can lower aquatic residue level; can avoid development of target species resistance.
P 2	Optimizing pesticide placement with respect to loss	Applicable where effectiveness is maintained; there may be moderate cost.
P 3	Using crop rotation	Universally applicable; can reduce pesticide loss and use significantly; some indirect cost if less profitable crop is planted.
P 4	Using resistant crop varieties	Applicable to a number of crops; can sometimes eliminate need for insecticide and fungicide use; only slightly useful for weed control.
P 5	Optimizing crop planting time	Applicable to many crops; can reduce need for pesticides; there may be moderate cost.
P 6	Optimizing pesticide formulation	Some commercially available alternatives; can reduce necessary rates of pesticide application.
P 7	Using mechanical control methods	Applicable to weed and brush control; will reduce need for chemicals substantially; not economically favorable.
P 8	Reducing excessive treatment	Applicable to insect control; refined predictive techniques required.
P 9	Optimizing time of day for pesticide application	Universally applicable; can reduce necessary rates of pesticide application.
P 10	Optimizing date of pesticide application	Applicable only when pest control is not adversely affected; little or no cost.

P 11 Using integrated control programs	Effective pest control with reduction in amount of pesticide used; program development difficult.
P 12 Using biological control methods	Very successful in a few cases; can reduce insecticide and herbicide use appreciably.
P 13 Improved management of aerial applications	Can reduce contamination of nontarget areas.

Source: Adapted from Control of water pollution from cropland. Volume 1, A manual for guideline development, USDA/EPA 1975.

Table 7.--Management practices for reducing nutrient loss from agricultural applications.

No.	Nutrient Control Practice	Practice Highlights
N 1	Eliminating excessive fertilization	May cut nitrate leaching appreciably, reduces fertilizer cost; has no effect on yield if minimum application rate is known for site conditions.
	Leaching Control	
N 2	Timing nitrogen application	Reduces nitrate leaching; increases nitrogen use efficiency; ideal timing may be less convenient to user.
N 3	Using crop rotations	Substantially reduces nutrient inputs; not compatible with many farm enterprises; reduces erosion and pesticide use.
N 4	Using organic wastes for fertilizer	Economic gain for some farm enterprises; slow release of nutrients; problems in spreading; contamination of land with toxic material possible.
N 5	Plowing-under green legume crops	Reduce need for nitrogen fertilizer; not always feasible.
N 6	Using winter cover crops	Uses nitrate and reduces percolation; not applicable in moisture deficient regions; reduces winter erosion.
N 7	Controlling fertilizer release or transformation	May decrease nitrate leaching; needs additonal research and developement.
	Control of Nutrients in Runoff	
N 8	Incorporating surface applications	Reduces nutrients in runoff; no yield effects; not always possible; adds costs in some cases.

N 9	Controlling surface applications	Useful if incorporation is not feasible.
N 10	Using legumes in haylands and pastures	Replaces nitrogen fertilizer; limited applicability; difficult to manage.

Control of Nutrient Loss by Erosion

N 11	Timing fertilizer plow-down	Reduces erosion and nutrient loss; may be less convenient.
N 12	Timing fertilizer side dressing (mainly nitrogen)	Minimizes potential leaching and runoff.

Source: Adapted from control of water pollution from cropland. Volume I, A manual for guideline development, USDA/EPA, 1975.

Table 8.--Principal types of erosion control practices.

No.	Erosion Control Practice	Practice Highlights
E 1	Conservation tillage-no-till plant in prior-crop residues	Most effective in dormant grass or small grain; highly effective in crop residues; minimizes spring sediment discharges and provides year-round control; reduces man, machine, and fuel requirements; delays soil warming and drying; requires more pesticides and nitrogen; limits fertilizer and pesticide placement options; some climatic and soil restrictions; increases water infiltration and reduces runoff.
E 2	Conservation tillage-other no-plow systems	Includes a variety of no-plow systems that retain some of the residues on the surface; more widely adaptable but somewhat less effective than E 1; advantages and disadvantages generally same as E 1 but to a lesser degree.
E 3	Sod-based rotations	Good meadows lose virtually no soil and reduce erosion from succeeding crops; total soil loss greatly reduced, but losses are unequally distributed over rotation cycle; aid in control of some diseases and pests; more fertilizer-placement options; less realized income from hay years, greater potential transport of water soluble P; some climatic restrictions.
E 4	Meadowless rotations	Aid in disease and pest control; may provide more continuous soil protection than one-crop system; much less effective than E 3.

E 5	Winter cover crop	Reduces winter erosion where corn stover has been removed and after low-residue crops; provides good base for conservation tillage next crop; usually no advantage over heavy cover of chopped stalks or straw; may reduce leaching of nitrate; water use by winter cover may reduce yield of cash crop in low rainfall areas.
E 6	Improved soil fertility	Can substantially reduce hazards as well as increase crop yields.
E 7	Timing of field operations	Fall plowing facilitates more timely planting in wet springs, but it greatly increases winter and early spring erosion hazards; optimum timing of spring operations can reduce erosion and increase yields.
E 8	Plow-plant systems	Rough, cloddy surface increases infiltration and reduces erosion; much less effective than E 1 and E 2 when long rain periods occur; seedling stands may be poor when moisture conditions are less than optimum. Mulch effect is lost by plowing.
E 9	Contouring	Can reduce average soil loss by 50 percent on moderate slopes, but less on steep slopes; loses effectiveness if rows break over; must be supported by terraces on long slopes; soil, climatic, and topographic limitations; not compatible with use of large farming equipment on many topographies. Does not affect fertilizer and pesticide application rates.

E 10 Row arrangement	Similar to contouring but less susceptible to row breakovers.
E 11 Contour strip cropping	Row crop and hay in alternate contour strips of appropriate width reduce soil loss to about 50 percent of that with the same rotation contoured only; fall seeded grain in lieu of meadow about half as effective; alternating corn and spring grain not effective; area must be suitable for across-slope farming and establishment of rotation meadows; favorable and unfavorable features similar to E 3 and E 9.
E 12 Terraces	Support contouring and agronomic practices by reducing effective slope length and runoff concentration; reduce erosion and conserve soil moisture; facilitate more intensive cropping; conventional gradient terraces may make the use of large equipment more difficult, but new designs have helped alleviate this problem; substantial initial cost and some maintenance costs.
E 13 Grassed waterways and outlets	Facilitate drainage of graded rows and terraced channels with minimal erosion; require establishment and maintenance costs and may interfere with use of large implements.
E 14 Ridge planting	Earlier warming and drying of row zone; reduces erosion by concentrating runoff flow in mulch-covered furrows; most effective when rows are across slope.
E 15 Contour listing	Minimizes row breakover; can reduce annual soil loss by 50 percent; loses

	effectiveness with post-emergence corn cultivation; disadvantages same as E 9.
E 16 Change in land use	Sometimes the only solution. Well-managed permanent grass or woodland effective where other control practices are inadequate; lost acreage can frequently be compensated for by more intensive use of less erodible land.
E 17 Edge of field practices	Edge of the field practices such as filter strips, sediment basins, etc. Soil resource may not be maintained.
E 18 Other practices	Contour furrows, diversions, subsurface drainage, land forming, closer row spacing, etc.

Source: Adapted from Control of water pollution from cropland. Volume I, A manual for guideline development, USDA/EPA, 1975.

Table 9.--Practices for reducing salinity.

No.	Salinity Control Practice	Practice Highlights
I 1	Control erosion	Reducing soil loss in areas of saline soils will reduce amount of mineral or salt dissolved.
I 2	Improve irrigation systems and management	Reducing the amount of seepage and deep percolation into saline aquifers can reduce salt loading over 50 percent.

Table 10.--Principal types of silvicultural practices for NPS control.

No.	Control Practices	Practice Highlights
S 1	Alternative harvesting methods	Includes a variety of harvesting methods depending on species, soils, slope, landform, future management objectives. Adaptable to most situations; with adverse effects on sediment production, soil compaction, and infiltration when improperly applied.
S 2	Streamside management	Includes management of a specified zone along a stream for production of various resources including timber, recreation, wildlife, water quality, and forage. May include complete protection as a buffer strip, fencing, directional felling, or limitations on equipment use to reduce sediment, pesticides or nutrients, and to provide shade for temperature control.
S 3	Bank and slope stabilization and critical area stabilization	Seeding and/or planting and fertilization (mulching if necessary) on bare soil areas, especially road banks and fills. Reduces length of time necessary to achieve a high level of soil stabilization, thereby reducing annual and total amount of sediment produced.
S 4	Onsite water management	May include water bars, ditches, ferms, culverts, drains, energy dissipators, or temporary storage structures. Used singly, or in combinations, to control water movement dependong on soils, vegetation, slope, and other management considerations to reduce erosion.
S 5	Pesticide management	Proper selection of pesticide and application rate, timing of application, establishment of "no-spray" zones, development and utilization of pest and disease resistant plant species, biological control methods, and alternative control methods are

		all part of this practice depending on the specific site pest, and situation. Application of these various elements combine to reduce potential pesticide pollution.
S 6	Technical assistance	Provide technical assistance in road location and design, harvesting systems, and plant species for stabilization purposes to prevent erosion and sedimentation problems.

Figure 14.--BMP's for nonpoint source control

Figure 15.--Conservation tillage

Figure 16.--Irrigation water management

Water

A subjective rating was applied to the water quality impact analysis and is summarized in table A-1 in the Appendix.

Alternative I

Some water quality improvement is anticipated by reducing bacteria, nutrients, and oxygen-depleting material through the ongoing Federal permit program (National Pollution Discharge Elimination System) for controlling animal wastes. Ongoing USDA programs in agricultural waste management assistance will continue to reduce some adverse effects of nonpoint sources on water quality.

EPA and state certification programs for pesticide applicators and the EPA pesticide registration program will have a beneficial effect on water quality.

Future demand for food, fiber, and living space will require additional marginal land to be brought into crop production at an increasing rate. This new land will have a higher erosion rate potentially leading to increased pollution by sediment and adsorbed chemicals. In general, water quality is predicted to continue to deteriorate from NPS loads with Alternative I.

Alternative II

Alternative II would provide the greatest reduction in NPS pollution. However, all standards for beneficial water use would not be met because of natural background loads to streams, loads from point sources, technical limitations, and incomplete participation of private landowners. Effects on water quality parameters would be:

(1) Reduction in pesticides and nutrients by better management of application rates, reduction in sediment-associated chemicals delivered to the streams, new techniques, and more environmentally acceptable products as a result of national concern.

(2) Increase in oxygen levels and reduction in bacteria count by adequate animal waste management, reduced access of domestic animals to streams, and reduced runoff from grazed pastures.

(3) Reduction in suspended solids and stream bedloads by increased installation of erosion and sediment control practices.

(4) Reduction in dissolved solids by improved systems of on-farm irrigation and off-farm water conveyance and better irrigation water management.

Alternative III

Streams and lakes considered in this alternative are generally those not receiving high loads of NPS pollutants and having a corresponding lower NPS control cost per stream mile or lake area.

Effects on national water quality may be summarized as follows: (1) approximately 30 percent of streams and lakes considered in Alternative II would be improved and (2) the streams in treated areas would have a good potential for meeting the national water quality goals. Sediment and associated pollutants would be significantly reduced through use of management practices that emphasize more vegetative and management practices. Management practices for control of pesticides, fertilizer, and animal wastes would significantly reduce levels of these pollutants.

Alternative IV

Concentrating treatment on those streams receiving high loads of NPS pollutants would have a corresponding high cost of adequately reducing the nonpoint sources to meet national water quality goals.

The national water quality impacts may be summarized as follows: (1) approximately 10 percent of the streams and lakes considered in Alternative II would be improved toward meeting the national water quality goals, and (2) the streams in the treated areas will not have a high potential of meeting national water quality goals because of potential changes in stream dynamics and existing geological conditions. Reduction of pollutant loads would result from extensive application of BMP's including changes in land use, expensive structural practices, and restrictive chemical use.

Alternative V

Although Alternative V will allow more streams to be eligible than Alternatives III or IV, slightly fewer streams will actually be selected than Alternative III. However, the potential for successfully improving water quality in the selected project areas will be much greater. This assumes that a greater local desire for implementation, adequacy of project design, and efficiency of project administration will result in greater potential for success. Approximately 25 percent of the streams and lakes considered in Alternative II would be addressed.

Land

Alternative I

There are approximately 363 million acres of cropland, 886 million acres of pastureland and rangeland, and 718 million acres of forest land. Ongoing programs for soil resource conservation will adequately treat about 9 million acres of cropland per year. It must be recognized that this would not be a net increase in area adequately treated. Continuing changes in technology, lifespan of practices, land ownership and farm enterprises cause a high percentage of the land to require retreatment. The National Water Assessment projects in its modified central case alternative estimated that 178 million acres will require treatment for erosion control. The national soil loss from cropland is now about 9 ton/acre/yr and is estimated to increase to 9.9 ton/acre/yr by 2000. Some soil content increase of nutrients and pesticides could occur due to excessive application rates.

Alternative II

With this alternative about 10 to 15 percent of the Class IV and V lands used for cropland may be converted to other uses such as permanent hay or pastureland or left as idle grassland. The crop yields on other treated lands will continue to increase in the long term. The increase will be sufficient to replace production lost on Class IV and V land that were taken out of production and to meet future demands as projected by OBERS E'. 1/

The total acreage of various crops would be essentially unaffected by a broad application of RCWP through this alternative. However, the location of some crops may be changed considerably to meet water quality standards. Row crops, for which normal farming practices produce more sediment and which require more nutrients or pesticides, may be moved from relatively steep slops to flat lands. The less erosive crops such as legume, hay, and other close-grown crops may then be moved from the flat lands to the gently sloping, more erosive lands. Other than the improvement in water quality, the effects of such changes from a national viewpoint would be minimal, because any decrease in productivity from one acre would be offset by an increase from another.

1/ OBERS series are projections of economic activity for the Nation and states and for economic, statistical, and hydrologic areas. Included are projections of population, personal income, employment, and earnings of persons and of industry. Agricultural projections include commodity production and value and use of land in farms.

OBERS represents a major output of a program of economic measurement, analysis, and projection conducted by the Bureau of Economic Analysis (BEA), formerly the Office of Business Economics (OBE), U.S. Department of Commerce; and the Economic, Statistic, and Cooperative Service (ESCS), formerly the Economic Research Service of the U.S. Department of Agriculture. The program is called OBERS, signifying a unified effort by OBE and ERS.

OBERS Series E was published in 1974 based on population projections of 1972. Series C, published in 1972 was based on 1967 population projections. Series C assumes birth rates higher than experienced in the late 1960's and early 1970's. Series E assumes a birth rate that will eventually result in no further population growth except for immigration. The Series E assumption results in a population of 264,430,000 in the year 2000.

The agricultural portion of Series E was revised in 1975 to reflect (1) changes in domestic consumption patterns and (2) increased exports. Exports are assumed to be higher than experienced in the 1960's but fall below high levels ofthe early 1970's. These revised projections are referred to as E Prime (E'); Series E' is the most widely used in resource planning.

The OBERS E' export demand projections assume an export growth rate of 2.75 percent per year by 1985 and a 3.25 percent growth rate by 2000 for the six major crops (barley, oats, corn, soybean, grain sorghum, and wheat).

From a local viewpoint or that of an individual farm unit, impacts may be more severe. A farm unit that consists primarily of Class IV and V lands may experience a considerable decrease in the value of its production while the unit with Class I and II lands may experience an increase. However, normally, such a reduction would be only temporary. In the long run, the productivity of the erosive lands would probably be reduced far more by the continued erosion than by the application of BMP's.

The soil loss on crop lands in the areas treated would be reduced 30 to 50 percent. Nationwide, the average soil loss would be reduced about 35 percent or 3.4 tons per acre.

About 64 million acres would be treated in areas that have a total of 162 million acres of cropland. Thus about 40 percent of the cropland in the affected areas will be treated for sediment control. These and other lands will be treated to control pesticides, nutrients, and animal wastes.

Alternative III

Alternative III would affect about 30 percent of the area affected by Alternative II. Land use would be similar to Alternative II, but proportionately less Class IV and V lands would be taken from cropland use. There would also be less internal shifting of the cropping systems than with the other alternatives, and therefore, a much smaller adverse effect locally from reduced value of production on some farm units.

About 15 million acres would be treated in areas with total cropland of 46 million acres; thus about one-third of the cropland in the affected areas would be treated for sediment control. Many of these lands and others would also be treated to control pesticides, nutrients, and animal wastes.

Soil loss would be reduced by about 326 million tons annually, or about 10 percent nationally.

Alternative IV

The effects of Alternative IV would be similar to Alternative II, but to a lesser extent. The effects would occur on about 10 percent of the areas affected by Alternative II. The amount of Class IV and V lands taken from cropland use could be expected to be proportionately greater than in any of the other alternatives. About 10.5 million acres would be treated in areas with a total cropland of 16 million acres; thus, about two-thirds of the cropland in the affected areas would be treated for sediment control. Many of these and other lands would also be treated to control pesticides, nutrients, and animal wastes.

National soil loss would be reduced about 3 percent, or 109 million tons annually. The reduction would be over a much smaller area than with Alternative III as indicated by the amount of cropland in the treatment areas.

Alternative V

The impacts of Alternative V would be similar to Alternative II but to a lesser extent. This alternative would affect about one-fourth of the area affected by Alternative II. About 13.6 million acres would be treated in areas containing about 37 million acres of cropland; thus, about 37 percent of the cropland acres in the affected areas would be treated for sediment control. Many of these and other lands would also be treated to control pesticides, nutrients, and animal wastes.

As in Alternatives III and IV, national soil loss would be reduced about 7 percent, or 254 million tons.

The land quality impact analysis is provided in table A-2.

Air

Alternative I

The consequences of selecting Alternative I would be to accept present air quality conditions in a future without RCWP. Air quality would remain about as it is at present. Greater amounts of dust and pesticides will probably enter the atmosphere than at the present but not to the point of constituting a significant national change or problem.

Alternative II

The consequences of selecting Alternative II would be slightly improved air quality in localized regions. From a national viewpoint, the changes probably would not be significant. Short-term increases in blowing soil during BMP application would be more than offset by decreases in blowing soil when BMP's are established. The changes in amount of odor would be positive, but would be significant only in local areas that now have a problem. Decrease in pesticide drift and volatilization could be very significant, thus improving local air and water quality.

Alternatives III, IV, and V

The consequences of selecting Alternative III, IV, or V would be essentially similar to the consequences associated with Alternative II but at reduced levels.

Fish and wildlife

Given the present method of national level evaluations, there is a relatively high degree of uncertainty over net long-term effects to fish and wildlife. Consequently, it is necessary to evaluate the effects of program alternatives on fish and wildlife on a relative basis. Such an evaluation is summarized in table A-3.

Alternative I

The net national beneficial and adverse consequences to fish and wildlife associated with Alternative I are predicted to be a slight decline in fish habitat values and a moderate decline in wildlife habitat values. Some increases in fish habitat values would occur in areas benefited by reductions in water pollution as a result of other ongoing programs. However, this improvement would probably be more than offset by the negative effects of more intensive uses of land and water for urban development, recreation, agriculture, and industry. The wildlife habitat value decreases would occur in areas where increases in erosion or cover monotypes are predicted to occur, primarily on agricultural and urban lands. Improved irrigation efficiency would probably contribute to regionally important decreases in wetland habitat values. Overall, national wetland wildlife values are expected to decline, but only very slightly.

Alternative II

The broad overall national consequences to fish and wildlife of selecting Alternative II are predicted to be a moderate increase in terrestrial habitat values and similar changes in aquatic habitat values. These changes would primarily benefit farmland and woodland wildlife in the project area and fish in lakes and streams downstream from private rural lands. Wetland habitat values would be improved by application of practices that maintain or develop wetlands to maintain water quality and incidentally provide food and cover for wildlife. Some wetland wildlife habitat values and acreages might be significantly decreased where inefficient irrigation systems would be treated with BMP's to reduce water loss. Mitigation of wetland losses would be expected on some sites. The extent to which changing land use would affect fish and wildlife habitat values is relatively unknown. The probable increase in permanent vegetation would be beneficial, but if additional new replacement lands were brought into production, it would be potentially harmful to wildlife. BMP's featuring conservation tillage also present uncertainty over whether the benefits from increased vegetative cover exceed possible detriments caused by increased pesticide use. Careful program evaluation will be needed to improve the understanding of effects on fish and wildlife.

Alternative III

The beneficial and adverse consequences to fish and wildlife from selecting Alternative III are predicted to be very similar to Alternative II but reduced in magnitude by a factor of about 3. Within that broad estimate, fish habitat would probably benefit slightly more than wildlife because of the effect of improving more units of surface water per unit of expenditure. Thus, Alternative III would appear to have the greatest beneficial effects to fish and wildlife per unit expenditure of RCWP funds.

Alternative IV

The beneficial and adverse consequences to fish and wildlife of selecting Alternative IV are predicted to be very similar to Alternative II but reduced in magnitude by a factor of about 8. Within that broad estimate, fish habitat values would probably benefit less than wildlife. In concentrating treatment in high volume source areas, water quality response would probably not be sufficient to provide important benefits to fish production. Similarly, concentrated treatment would probably not bring about important increases in wildlife habitat elements that would otherwise be limiting.

Alternative V

The beneficial and adverse consequences to fish and wildlife from selecting Alternative V are predicted to be very similar to Alternative II but reduced in magnitude by a factor of about 4. Fish and wildlife would derive important benefits from improved water quality, decreased erosion, and increased diversity of vegetative cover type. Wetlands associated with irrigation systems would be detrimentally affected to the extent that full mitigation is not feasible. Also, possible increased applications of pesticides compared to a future without the program pose an uncertain degree of hazard to fish and wildlife. Again, careful program evaluation will be needed to fully understand effects on wildlife.

Scenic resource quality

Alternative I

The consequences of selecting Alternative I would be to accept scenic quality conditions as they would occur in a future without RCWP. It is estimated that scenic resource quality will decline slightly from a national viewpoint. Scenic quality of surface waters will be improved slightly because of the benefits of other conservation programs. However, increased agricultural, urban, and industrial uses of water would be expected to offset that beneficial effect on a national scale.

Alternative II

The consequences of selecting Alternative II would be to cause important improvements in scenic quality of lands and waters in the treated private rural areas. Adequate treatment of all NPS areas would greatly reduce the adverse scenic quality stemming from eroded lands and sediment-laden surface waters. The application of BMP's would increase the scenic variety of rural landscapes and could substantially reduce nutrient pollutants and consequently decrease the growth of excessive amounts of aquatic plants.

Alternatives III, IV, and V

The consequences of selecting Alternatives III, IV, and V would be to effect significant increases in scenic quality of land similar to Alternative II. The magnitude of change in the scenic quality of water cannot be determined because of uncertainties about the relationship between BMP's and the levels of NPS pollutants delivered to surface waters.

Social impacts

Alternative I

No additional manpower would be required.

Alternative II

Implementation of this alternative would require an additional 28,500 person-years each year for a 10-year period to provide the technical assistance needed for specific site plan development and installation. The program would create a public awareness of the interrelationship between NPS problems and water quality.

Alternative III

Implementation of this alternative would require an additional 7,600 person-years for a 10-year period to provide the technical assistance needed for specific site plan preparation and installation.

Compared to Alternative IV, the environmental effects of the plan, such as improved water quality, will benefit more people. More landowners and local, state, and federal government employees would participate in improving water quality than would participate in Alternative IV, because more watersheds and more acres would be treated with the same amount of funds. Compared to Alternative II, fewer landowners and local, state, and federal government employees would participate in improvement, because fewer watershed areas and fewer acres would be treated.

Alternative IV

Implementation of this alternative would require an additional 4,100 person-years for a 10-year period to provide the technical assistance needed for specific site plan development and installation. The environmental effects of the plan, such as improved water quality, will be realized by a smaller proportion of the population than Alternative III. Fewer landowners and local, state, and federal government employees would participate in water quality improvement because fewer watershed areas and fewer acres would be treated with the limited funds.

Alternative V

Implementation of this alternative would require about 6,200 person-years for a 10-year period to provide the technical assistance needed for specific site plan development and installation. The environmental effects of the plan such as improved water quality will benefit somewhat smaller proportion of the population than Alternative III but more than Alternative IV. Compared to Alternative III, fewer landowners and local, state, and federal government employees will participate in water quality improvement.

Civil rights

This program was examined for its potential effect on civil rights, and it was concluded that there would be no adverse effects on minorities or women.

This program will be conducted in compliance with all requirements on nondiscrimination as contained in the Civil Rights Act of 1964 and the Regulations of the Secretary of Agriculture (7 C.F.R. Sec. 15.1-15-12), which provide that no person in the United States shall, because of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any activity receiving federal financial assistance.

Further, it is SCS policy not to discriminate against any individual because of sex, age, or handicap.

Economic effects

Alternative II

The total cost of BMP treatment for Alternative II would be about $10 billion. This would include about to $4.7 billion for sediment control, $1.8 billion for pesticide and nutrient control, $.5 billion for animal waste control, and $3 billion for salinity reduction.

The Iowa State University model for erosion control was used to determine probable economic impacts of reducing sediment deliveries by various increments. Several producing areas with significant erosion rates were selected for analysis. Those selected areas would include many of the sediment problem areas throughout the mid-Atlantic, Southeast, and Central states from the Great Lakes to the Gulf.

Two conditions were developed: A base and a 30 to 50 percent reduction in sediment yield. In both cases, the total quantity of agricultural products was held constant at 1985 OBERS E' 1/ projection demand levels considering a moderate export. Gross returns to agriculture would therefore be unaltered, but the cost of producing the given output would increase.

There would be two exceptions to these conditions. First, the BMP's employed to reduce sediment delivery would probably also maintain the productivity of an otherwise deteriorating soil resource base. Thus, crop yields in the long run would be greater on the treated acres than would be the case without the treatments. The magnitude of the difference in yields would vary from no significant differences on lands with deep topsoils and relatively low soil loss rates to such yield reductions on lands with shallow soils and high erosion rates that either economic production would cease or cropping systems would be changed to less intensive uses. Second, while total agricultural production may not change, cropping systems may need to be changed on individual farms in order to reduce soil losses on sediment delivery. Row crops on erosive steep soils may need to be shifted to lesser erosive soils, often on

other farms or other areas. Thus, gross returns on an individual cooperating farm may decrease significantly when the intensive crops are moved to other farms.

Generally, where the sediment yield rates are decreased 30 to 50 percent by erosion control measures, the average crop production cost will increase $11.50 per acre of all cropland used. This would include the annual cost of the treatment practices. About 64 million acres were treated in an area containing 162 million acres of cropland. Installation costs averaged $76.50 per acre treated and $30 per acre of cropland used in the treatment areas.

Minimum tillage would increase 118 percent with a 36 percent increase in pesticide use. About 40 percent of the cropland in the problem areas required treatment to reduce the sediment to acceptable levels.

The treatment cost for sediment control would average about $35 per mile of stream in the treatment area, or about $100 per mile of stream in the treatment areas that do not meet EPA quality standards. The treatment cost would be about $270 per acre of water surface.

The total cost of treating pesticide pollutants is estimated to be about $2 billion. This estimate is determined by an average cost of $7 to $12 per acre treated. The treatment measures are not expected to have any significant effect on crop yields but would decrease the cost of pesticide use because of more efficient use of pesticides.

The total cost of treating animal waste for the purposes of this program is estimated to be about $500,000. This estimate is determined by an average cost of about $50 per acre treated. The practices would have no significant impact on gross returns to individual operators but would increase their production costs by at least the cost of installing the BMP's.

The total cost of salinity practices on irrigated land is estimated to be about $3 billion. The practices may increase crop yields in those areas where water shortages occur and where the treatments are designed for increased water use efficiency. In a very few areas the treatments may reduce the water application rate to the extent that crop yield would diminish. In a few areas the best treatment may be to remove the highly saline irrigated land from crop production.

Alternative III

The total cost of the BMP treatments for Alternative III would be about $360 million for pesticide and nutrient control, $100 million for animal waste, $600 million for salinity reduction, and $935 million for sediment control.

Generally, the economic effects of the treatments would be similar to Alternative II except for the composite of BMP's. The impacts of treating for pesticides and animal wastes would be similar to Alternative II but may share a greater proportion of the total treatment than in any other alternative. Salinity control costs may, however, be of lesser proportion than with other alternatives.

With the sediment yield rates reduced 30 to 50 percent by erosion control measures, average crop production costs would decrease $4 per acre of cropland used including the annual cost of treatment practices. About 15 million acres would be treated in an area containing about 46 million acres of cropland. Installation costs would average $63.50 per acre treated and $20 per acre of cropland used in the treatment area. Minimum tillage would increase 25 percent which is associated with an increase of 5 percent for pesticide use. About one-third of the cropland would require treatment to reduce the sediment to acceptable levels.

The treatment cost for sediment control would average about $12 per mile of stream in the treatment area or about $36 per mile of stream not meeting EPA quality standards. The treatment cost would be about $80 per water surface acre in the treatment area.

Alternative IV

The total cost of BMP treatments for Alternative IV is estimated to be about $360 million for pesticide and nutrient control, $100 million for animal waste, $600 million for salinity reduction, and $935 million for sediment control.

Generally the economic effects of the treatments would be similar to Alternative II except for the composite of BMP's, which would include more terracing than Alternatives II or III. There would also be some lands removed from crop production.

If sediment yield rates were reduced 30 to 50 percent by erosion control practices, average crop production costs would increase $5 per acre of cropland used, including the cost treatment practices. About 10.5 million acres would be treated in an area containing 16 million acres of cropland. Installation costs would average $89 per acre and $58 per acre of cropland in the treated area. Minimum tillage would increase 400 percent which is associated with an increase of 41 percent for pesticides used. About two-thirds of the cropland required treatment to reduce the sediment to acceptable levels.

The treatment cost for sediment control would average about $60 per mile of stream in the treatment area or about $120 per mile of stream not meeting EPA quality standards. The treatment cost would be about $2,000 per acre of water surface.

The effects of pesticide and nutrient control would be similar to Alternative II but of a lesser proportion to total expenditure than with other alternatives. Salinity reduction may receive a greater proportion of the expenditure, but the effects would be similar to that of Alternative II.

Alternative V

The total cost of BMP treatments for Alternative V is estimated to be about $360 million for pesticide and nutrient control, $100 million for animal waste control, $600 million for salinity resolution, and $935 million for sediment control.

Generally, the economic effects of treatments would be similar to Alternative II but would affect fewer acres.

The relative changes in conservation practices for sediment control for the various alternatives are shown in table A-4 of Appendix A.

Energy

Alternative I

Higher energy prices should encourage continued energy conservation and the use of different and more economical energy sources under Alternative I. Additionally, much marginal land would continue to be cropped, which requires more energy use per unit of output.

Alternatives II, III, IV, and V

Under the other alternatives additional energy would be used in implementing and monitoring water pollution control practices. Some of the required farming practices necessary for reduced water pollution would increase energy requirements while other practices would consume less energy. Less energy would also be required on lands converted to grassland after establishment of a vegetative cover. Less energy would be needed to treat water for municipal and industrial use. Extended life span and reduced maintenance for water impoundments would also require less energy. Reduction in energy consumption would be most significant in Alternative II. Energy savings in Alternatives III and V would be less significant than II but more than IV. Optimal utilization of nitrogen fertilizer and use of nitrogen in animal wastes could reduce total energy input requirements on farms by 10 to 15 percent or more in many areas.

Endangered species

As of May 17, 1978, there were 203 animals and 17 plants on the federal list of endangered or threatened species as authorized by the Endangered Species Act of 1973. These species are sporadically and irregularly distributed in the United States. Some listed species would almost certainly be encountered at different points during application of BMP's to private rural lands. SCS has well-established procedures to deal with endangered species on a case-by-case basis as they are encountered in planning activities. In accordance with the law, SCS procedures are designed to insure that no action will be implemented that will jeopardize the continued existence of listed species or destroy their habitats. For purposes of this analysis, it was assumed that this program in any of its alternative forms would be conducted so that there will be no significant detrimental consequences to threatened or endangered species or their critical habitats.

Cultural resources

Important cultural (historical and archeological) resources are irregularly distributed across the U.S. landscape, and a proportion of them are on private rural lands. Installation of BMP's over large areas where NPS

pollutants originate would virtually guarantee that some important cultural resources would be encountered. BMP's to be installed under all of the alternatives would include some structural and some nonstructural (primarily vegetative) measures. Vegetative practices are unlikely to affect cultural resources. In contrast, structural measures have a high potential for adversely affecting such resources. SCS has well-established planning procedures to address cultural resources encountered in planning activities. These procedures are to be adhered to and all applicable laws regarding cultural resources are to be followed. Therefore, no significant detrimental consequences to cultural resources from implementation of any of the program alternatives would be expected.

Unavoidable adverse effects

If RCWP were not funded, the analysis indicates that there would be a continued degradation in water quality from agriculture-related pollutants. There would be loss of time to solve the problem and increased costs in reducing NPS pollutants to meet the national goals for clean surface and ground water.

Implementation of Alternatives II, III, IV, or V would result in a slight loss of managerial discretion by owners or operators entering into 5- or 10-year binding contracts. This effect might be perceived as somewhat of a loss of personal freedom. Alternatives II and IV require removing significant acreages from crop production, which may be controversial to local landowners and which might affect total agricultural production. No other significant unavoidable adverse affects are anticipated. The limited temporary increases in noise, air pollution, and soil erosion resulting from the installation of BMP's and the associated minor losses of wildlife habitat were not considered significant from a national viewpoint. However, sediment catch basins would preempt other uses of the sites and tend toward "irreversible" uses of limited areas.

Irreversible and irretrievable commitment of resources

Alternative I

Not applicable.

Alternatives II, III, IV, and V

Funds, labor, materials, and energy expended to install BMP's and administer the four program alternatives would be irretrievably committed. Land associated with permanent structural practices would be irretrievably committed for the foreseeable future. If nonstructural BMP's were installed under the four alternatives, no irreversible effects on the natural resource base would be expected. Alternative III and to a slightly lower degree Alternative V would heavily emphasize nonstructural practices. Alternatives II and IV would include more structural practices.

POSSIBLE CONFLICTS

Farmers might be reluctant to enter into long-term contracts on water quality improvement that might substantially reduce their income from the production of food and fiber. There might be conflicts between the administration of this program and other programs such as Agriculture Conservation Program (ACP), Great Plains Conservation Program (GPCP), Rural Abandoned Mine Program (RAMP), and similar state programs. These alternative programs would complement the set-aside programs currently being carried out by USDA. There would be years when increased agricultural production needs of the United States would not be conducive to implementing the BMP's to carry out RCWP. Strong economic incentive programs may be perceived as conflicting with efforts to establish a stronger ethical and voluntary basis for environmental stewardship. Implementing the "208" plans would no doubt stimulate some controversy about resource allocation on local levels.

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(Asterisk indicates those providing substantive comments)

LETTERS OF COMMENTS RECEIVED

ON DRAFT EIS

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July 7, 1978

Mr. Edward E. Thomas
Assistant Administrator for Land Resources
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Post Office Box 2890
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Dear Mr. Thomas:

Thank you for the opportunity to participate in the proposed rule making for the Rural Clean Water Program. Since I have not yet had an opportunity to discuss the proposed regulations with members of the State Policy Advisory Committee of Arkansas and the many other persons having interest and expertise in the matter, I ask that you consider the following comments to be provisional. I will, however, formally submit final comments on the EIS prior to August 11, 1978, and final comments on the proposed regulations prior to August 28, 1978, as requested in the respective public notices.

The Department of Pollution Control and Ecology is the agency responsible for the development of the 208 plan for Arkansas. Because Arkansas' economy is heavily dependent upon agriculture and because Arkansas is interested in maintaining high quality water, the Department is familiar with the intricacies of those aspects of water quality management problems commonly referred to as agricultural nonpoint pollution problems. The Department looks to the Rural Clean Water Program as a significant part of the total water quality management program in the State. Thus, my comments are directed to the relationships that the Rural Clean Water Program could have on Arkansas' water quality management plan.

Let me first briefly mention the alternatives mentioned in the EIS. Figure 11 of the EIS purports to show the relative benefits of the various alternatives. Noting the caution stated in Conclusion No. 6 (page 10 of the EIS) that "the relationship between BMP application and actual improvement in water quality is not entirely understood," I wonder to what extent Figure 11 accurately portrays the relative benefits of the alternatives.

Considering the uncertain knowledge regarding the water quality benefits of BMP applications, I also wonder why the capability to monitor the effects of the proposed programs was not considered a factor in devising

and evaluating the alternatives. What I am suggesting is that with improved knowledge concerning the effects of BMP application, a more cost-effective program can be developed over time. Without that knowledge, progress in the Rural Clean Water Program will be more by accident and less by design.

Before leaving the EIS, I would like to request that the Department receive one copy which is suitable for copying. The copy which we received contains information which cannot be read, let alone copied for distribution.

My first impression of the proposed regulations is that they could be considerably improved by giving the state water quality management agencies more authority in the direction and implementation of the programs provided by the proposed regulations, by stressing water quality aspects of such programs and by explicitly providing for public participation in the implementation of the programs.

The state water quality management agencies, under the Federal Water Pollution Control Act, as amended, have first line responsibility for the development and implementation of the water quality management plans. Since the Rural Clean Water Program is a part of the total state planning effort, it would appear essential to explicitly provide the mechanics for keeping the Rural Clean Water Program in consonance with the state's efforts and responsibilities. Briefly stated, the proposed regulations appear to contemplate a dual standard between the state agencies, which are responsible for the success of the plan and which are responsible for assuring adequate public involvement, and the federal agencies, which will be conducting programs essential to the success of the state programs but which will be provided a degree of autonomy beyond that of any other agency or person affected by the plan.

In order to provide public participation to the degree required under the 208 plan, I feel that the proposed regulations would need to undergo serious study and modification to track similar requirements in other phases of the 208 plan.

In order that the state water quality agencies would have more control over the destiny of their plans and that the RCWP projects maintain proper orientation to water quality objectives, I offer the following comments.

1. Amend Section 634.4(m) to give to the states the responsibility to report to EPA and USDA those activities under the implementation of the Rural Clean Water Program which are inconsistent with, or not beneficial to, the goals of the state water quality management plan. This section should be further amended to give the states the right to require the suspension or termination of such activities by petitioning appropriate RCWP officials. This section should be further amended to give the state

agencies concurrent authorities with EPA and USDA in the selection of project areas to be monitored and evaluated in their jurisdiction.

2. Amend Section 634.10 and 634.13 to reflect increased eligibility considerations for those projects which are amenable to water quality monitoring or, alternatively, the sections should be amended to reflect some decrease in eligibility for areas which are not amenable to water quality monitoring programs. The purpose of this suggestion is, of course, to assure that RCWP funds are not initially allocated in areas where the effects of the BMP application cannot be evaluated.

3. Amend Subsection 634.14(C)(5) to clarify the justification for increasing federal support beyond the 50 percent level where the installation of BMP's create benefits which accrue "primarily offsite." Since the objective of BMP's is to improve downstream water quality and since the 208 plans are not authorized to encourage or require BMP's which are not directed to water quality benefits, the present language of this Subsection is questionable in utility and purpose.

4. Amend Section 634.17 to provide for state water quality agency input into the initiation and determination of suspension orders and terminations, as suggested in the above comments relative to Section 634.4(m).

5. Amend Subsection 634.28(K)(3) to include, considering the extent of the violation, factors concerning the effects upon water quality and the extent to which the violation affected the administration of the applicable state water quality management plan.

6. Amend Section 634.40 to provide for concurrent authority of the state water quality management agency in the selection of projects to be monitored, evaluated and analyzed in the state in which the agency has jurisdiction. By having concurrent authority with EPA, the state will be better assured that the resulting information will be responsive to state informational needs.

7. Amend Subsection 634.40(A)(7) to clarify and otherwise provide for the requirement that assessments of the chemical nature of upstream and downstream water quality be conducted in addition to the monitoring of the "drainage network of the project area," as provided in paragraph (i) thereof. Subsection 634.40(A)(7) should be further amended to provide for assessment of BOD demands exerted by sediments in the stream to which the waters of the project area discharge and for the assessment of water quality perturbations during and subsequent to rainfall events.

I hope the foregoing comments have been helpful, if only for purposes of discussion. Again, thank you for this opportunity to participate in this public meeting.

Sincerely yours,

Jarrell E. Southall
Director

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August 4, 1978

Mr. Ernest V. Todd
Task Force Leader
Soil Conservation Service
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Dear Mr. Todd:

We have reviewed the draft program environmental impact statement to implement Section 208(j) of Public Law 92-500 as amended by Section 35 of Public Law 95-217 (33 U.S.C. 1288) dated December 27, 1977. We are responding on behalf of the Public Health Service.

This impact statement is largely an assessment of five broad alternatives for implementing the Rural Clean Water Program (RCWP). The draft does not explain the rationale for choosing these particular alternatives. Why were these chosen over many other possible combinations which could also be used in implementing this program? There is not sufficient discussion for the reader to determine what the environmental impact of using the various management and structural practices might be, either individually, together, or relative to one another. The absence of figures to illustrate these practices (white spaces with captions are provided for figures 1-4, 14-17) compounds the problem. The authors might consider providing a brief appendix describing the various management practices, their costs, and relative environmental benefits and adverse effects.

A "selected alternative" is not stated and is left up to the reader, although Alternative V is stated as being "the most probable choice." The final EIS should select a "preferred alternative" based on all variables.

There appears to be considerable uncertainty between implementing best management practices (BMP) and improved rural water quality. "Because the relationship between BMP application and actual improvement in water quality is not entirely understood, there is much uncertainty over actual effects" (p. 10). Therefore it would seem highly desirable to incorporate into RCWP project plans continuing evaluations of project beneficial and adverse effects, beginning with project initiation and occurring periodically for the life of the project. In this way, the Department of Agriculture could quantitate the environmental and economic benefits and costs of various management techniques and make a reasonable determination as to proper areas for future expansion or elimination within the RCWP, in general.

On page 6 Alternative II states that 10 million acres would be treated for animal waste control. However, page 28, paragraph 4, states that pollution problems from animal wastes only affect a small portion of total production areas. The role of feedlots having less than 1000 animals should be examined in more detail and clarified.

The role of silviculture is not addressed as is pointed out in the draft EIS. Further consideration should be given to determining the role of silviculture in nonpoint source pollution.

Page 24 states that little is known about the effects of nonpoint source pollutants on the Nation's wetlands. It is also pointed out that little information is presently known about national habitat values for wildlife on private rural lands, habitat values for fish, and the effects of nonpoint source pollutants on those values. The final EIS should examine these issues and their relationship to a national program operation.

In reviewing some of the proposed procedures for land treatment, one wonders how these program procedures differ from past Soil Conservation Service programs other than in magnitude and funds expended.

The draft EIS speaks of owners or operators entering into 5 or 10 year contracts for certain land management procedures. What are plans for years 6 and 11? Plans for subsequent years should be addressed.

Thank you for the opportunity of reviewing this document. We would appreciate receiving two copies of the final statement when it is issued.

Sincerely yours,

William H. Foege, M.D.
Assistant Surgeon General
Director

THE OHIO STATE UNIVERSITY

July 31, 1978

Mr. Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221, S. Agriculture Bldg.
P. O. Box 2890
Washington, D. C. 20013

Dear Mr. Todd:

I have been asked by Dean Kottman, College of Agriculture and Home Economics and Dr. Berlie Schmidt, Chairman Department of Agronomy to comment on the draft program environmental impact statement for the implementation of PL 92-500 and PL 95-217.

I am concerned with the statements made on page 7, paragraph 2, "Affected environment". While I am in agreement with the statement on soil loss and sediment control, I find those on pesticide and nutrient control to be misleading and even erroneous. First it is important to note that, with the exception of nitrate-nitrogen, pesticides and nutrients are lost from agricultural land during runoff and erosion because these compounds are held tightly to soil particles. In fact, most of the phosphorus loss and much of the nitrogen loss are from native nutrients that were in the soil prior to cultivation by man. Inputs of N and P in precipitation can account for a large percentage of these elements lost from the land. While mismanagement of agricultural chemicals can result in their loss from land, the implication that this is a widespread occurrence is unjustified. Pest management programs and introduction of more degradable compounds have greatly reduced the hazards of pesticide loss from agricultural land. In fact, only residues of older chemicals such as DDT, dieldrin, chloradane, etc are found in sediments coming from agricultural land in the Corn Belt.

Phosphate fertilizer usage has continued at a steady rate during the last 30 years. Phosphorus soil tests in Ohio and other Corn Belt states show that most soils are at, or near the optimum level for crop production. While I am concerned that our extension programs continue to stress the need to keep phosphorus fertilization in line with crop needs, the evidence indicates that most farmers are using good management in this regard. The fact is that, of the phosphorus leaving agricultural land in runoff, 90% is of native soil origin.

Excessive application of nitrogen fertilizer can result in increased levels of nitrate in drainage waters. While this is especially true on permeable sands and organic soils, it should be kept in mind that there is an equal potential for denitrification losses of nitrogen from our more poorly drained soils. Higher costs of nitrogen fertilizer and a shift to ammonia forms of nitrogen has decreased the potential for nitrate leaching. Estimates by agronomists in the Corn Belt, including myself, indicate that nitrogen fertilizer rates are in line with crop needs.

Accelerated adoption of erosion control and livestock waste management programs will go a long way towards reducing the impact of agricultural pollution. Fertilizer and pesticide use restrictions are not warranted and cannot be justified in most areas.

Sincerely,

Terry J. Logan
Associate Professor

TJL/dm
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Berlie Schmidt

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

JAY S. HAMMOND, GOVERNOR

POUCH O – JUNEAU 99811

August 4, 1978

Mr. Ernest V. Todd, Task Force Leader
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Dear Mr. Todd:

RE: Review of the Draft Environmental Impact Statement, Rural Clean Water Program

A review of the Rural Clean Water Program Draft EIS indicates there is little basis upon which it can be criticized with regard to Alaska's interests.

One major point of criticism is, however, the lack of recognition of the Alaskan situation, either in absolute terms or relative to the lower 48 states. For example, on page 22-E, silviculturally-related pollution problems in Alaska have not been noted. On page 22-F, the Yukon Basin is identified as having non-point source suspended solids problems, and Southeast Alaska as having non-point source bacteria problems. The bases for these determinations are questionable. In fact, the source document, the unpublished NATIONAL WATER QUALITY INVENTORY, 1977 REPORT TO CONGRESS, has been criticized by State and federal agencies as being inaccurate, incomplete, and containing questionable analysis of incomplete data.

With regard to the Rural Clean Water Program per se, the basic program is directed toward correcting rather than preventing agricultural non-point source problems, and addresses only privately owned land (much of Alaska's new agriculture development is on land leased from the State on an agriculture-rights only basis); and the rules and regulations, have limited relevance to Alaska.

Sincerely,

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North Central Texas Council of Governments

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August 2, 1978

Mr. Ernest Todd
Rural Clean Water Task Force
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RE: 8-07-04022, Draft Environmental Impact Statement — Rural Clean Water Program

Dear Mr. Todd:

Your Draft EIS in connection with the above entitled project has been reviewed by the North Central Texas Council of Governments. This review included the notification of potentially affected local governments including Collin, Dallas, Denton, Ellis, Erath, Hood, Hunt, Johnson, Kaufman, Navarro, Palo Pinto, Parker, Rockwall, Somervell, Tarrant, and Wise Counties; Cities of Alvarado, Azle, Bridgeport, Dallas, Denton, Dublin, Flower Mound, Forney, Fort Worth, Garland, Granbury, Mesquite, Mineral Wells, Plano, Rockwall, Waxahachie, and Wolfe City. These local governments were invited to comment on the local impact of the proposal, however, no responses to this notification have been received as of this date.

In addition, the Draft EIS was reviewed for appropriate areawide concerns. This review process included consideration by the Government Applications Review Committee on July 12, 1978, and by the NCTCOG Executive Board on July 27, 1978. On the basis of that review process, the Board adopted the following areawide position:

> The NCTCOG Review Process has disclosed no conflict with the review criteria of areawide comprehensive planning as outlined in OMB Circular A-95 (revised). The Draft EIS accurately represents the scope of the proposed project, possible alternatives to the proposed project and the potential environmental impacts of each.
>
> In addition, it is recommended that if the Soil Conservation Service determines that areas within the North Central Texas region are eligible for participation in the Rural Clean Water Program, that the Soil Conservation Service initiate prior coordination efforts with NCTCOG to insure consistency and compatibility with NCTCOG's "208" water quality management planning efforts.

We sincerely thank you and your staff for your kind cooperation in this matter, and if we can be of further service or assistance, please feel free to call upon us.

Sincerely,

William J. Pitstick
Executive Director

WJP:aem
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STATE OF ALABAMA

WATER IMPROVEMENT COMMISSION

100

August 8, 1978

Mr. Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221-South Agriculture Building
Post Office Box 2890
Washington, D.C. 20013

Dear Mr. Todd:

We have reviewed the draft program environmental impact statement (EIS) for the Rural Clean Water Program and submit the following comments for your consideration:

1. Several activities involved in agricultural operations have not been adequately evaluated and/or included in the evaluation, e.g. hydrologic modifications, roads, agricultural related construction, and silviculture. Non-point source pollution from agricultural activities involves more than runoff from cropland and inadequate disposal of animal wastes.

2. Table 1 indicates that Alternative III rates second (to Alternative II) overall and in the impact category of water quality, which is the primary concern of the Federal legislation. However, the EIS recommends Alternative V because of "administrative flexibility" even though Alternative V rates lower than Alternative III for the impact categories of water quality, land quality, and wildlife habitat. If table 1 data is valid, then a detailed explanation of "administrative flexibility" is needed to justify the preference for Alternative V.

3. Alternative II presents the ideal program whereas Alternatives III, IV, and V are specialized splinter programs accomplishing less at lower funding. We recommend that the Alternative II program be prioritized and accomplished as funds become available. This approach would appear to be more compatible with the "Priorities" section discussed on page 14. In addition, the cost figure of $8 to $15 billion for Alternative II may be overstated since the program intent is to improve water quality

by reducing agricultural non-source pollution; conservation of the soil resource base is only a side benefit. From this standpoint, reduction of agricultural non-point source pollution is necessary only where it results in violations of accepted water quality standards; installation of cost-shared Best Management Practices should not be undertaken in areas of acceptable water quality simply to control soil erosion.

4. Table 2 indicates that the contribution of geologic erosion to total sediment yield is estimated to be 30 percent, second only to the cropland contribution of 50 percent, yet it is not addressed under sediment sources in the text.

5. Some administrative discrepancies which you may already be aware of are as follows:

   a. List of Figures. Figure 10 is page 22F, Figure 11 is page 29A, Figure 12 is page 30A, Figure 13 is page 33, Figure 14 is page 42, and Figure 16 is page 43. Figure 18 is out-of-sequence by page number.

   b. List of Tables. Page numbers are missing for Tables 8 and A-4.

   c. Page 8, paragraph 3. The figure of "35 percent" conflicts with the figure of "30 percent" used on page 6.

   d. Page 8, paragraph 5. The figure of "30 percent" conflicts with the figure of "25 percent" used on page 7.

   e. Page 10, paragraph 3. The last sentence appears to be worded improperly; perhaps the word "not" should be deleted.

   f. Pages 22C through 22F, Figures 7 through 10. An overlay of state boundaries would facilitate chart comprehension. The data shown for Alabama may change as a result of the Agricultural Runoff Management Plan now underway.

   g. Page 29B. The figure number is not shown, nor are all the alternatives displayed.

   h. Page 52, third paragraph from the bottom of the page. OBERS Series E was published in 1974 based on population projections of 1972. Series C was published in 1972 based on population projections of 1967.

i. Pages 60 through 78. It is noted that copies of the EIS were not sent to the OMB A-95 State Clearinghouse in Alabama which is operated by the Alabama Development Office. Perhaps other state A-95 agencies were not included on your mailing lists. Since the Rural Clean Water Program is to be federally funded, we suggest the State A-95 Clearinghouse agencies receive copies to be distributed for review and comments.

We submit these comments with the hope that they will assist you not only in the development of the EIS but also in developing the rules and regulations to implement the Rural Clean Water Program provided for in the Clean Water Act of 1977. We appreciate the magnitude of the tasks involved and commend you and your task force for the progress shown.

If we can be of further assistance, please contact us.

Very truly yours,

James E. McIndoe

James E. McIndoe, P.E.
Chief, Water Quality Planning Section
Water Improvement Commission

JEM/lds

ark-tex council of governments

maurice h. isbell, president • james d. goerke, executive director

August 7, 1978

Mr. Ernest V. Todd
Task Force Leader
Rural Clean Water Program
U.S. Dept. of Agri., SCS
Washington, D.C. 20250

SUBJECT: SAI# TX8 07 05 006 - Environmental Impact Statement

Dear Mr. Todd:

Enclosed are three (3) copies of the resolution of the Ark-Tex Council of Governments', indicating their approval of your application.

If we may be of any further service, please advise.

Sincerely,

Jo Cunningham

Jo Cunningham
Regional Services

Enclosures

RESOLUTION NO. 2029

RESOLUTION OF THE ARK-TEX COUNCIL OF GOVERNMENTS WITH REVIEW AND COMMENT ON A DRAFT RURAL CLEAN WATER PROGRAM ENVIRONMENTAL IMPACT STATEMENT BY THE U.S. DEPARTMENT OF AGRICULTURE/SOIL CONSERVATION SERVICE WHICH ANALYZES ALTERNATIVE METHODS TO ADMINISTER THE RURAL CLEAN WATER PROGRAM WHICH PROVIDES FINANCIAL ASSISTANCE, SPECIAL TECHNICAL ASSISTANCE, AND COST SHARING TO RURAL LAND USERS APPLYING BEST MANAGEMENT PRACTICES TO IMPROVE WATER QUALITY.

WHEREAS, under Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 and Title IV of the Intergovernmental Cooperation Act of 1968, the Ark-Tex Council of Governments has been designated as the area wide agency to review certain applications for which federal financial assistance is requested, and

WHEREAS, it is desirable and in the public interest that certain development plans be reviewed by the Ark-Tex Council of Governments for their consistency with the overall development of the Region.

NOW, THEREFORE BE IT RESOLVED BY THE ARK-TEX COUNCIL OF GOVERNMENTS:

Section 1 - That the Draft Rural Clean Water Program Environmental Impact Statement by the U.S. Department of Agriculture/Soil Conservation Service which analyzes alternative methods to administer the Rural Clean Water Program which provides financial assistance, special technical assistance, and cost sharing to rural land users applying best management practices to improve water quality has been reviewed by the Board of Directors and can reasonably be expected to become a part of the overall Regional Plan.

Section 2 - That the above mentioned program is needed to improve water quality and utilize best possible land use management practices.

PASSED, ADOPTED, SIGNED, AND APPROVED this 3rd day of August, 1978.

Troy E. Kern, President
Ark-Tex Council of Governments

ATTEST:

Bobby A. Ferguson, Secretary
Ark-Tex Council of Governments

CERTIFICATION

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF

☐ COG MINUTES ..... Date

☒ RESOLUTION NO. ..... AUG 8 1978 Date

..... EXECUTIVE DIRECTOR

RESOLUTION NO. 2029

RESOLUTION OF THE ARK-TEX COUNCIL OF GOVERNMENTS WITH REVIEW AND COMMENT ON A DRAFT RURAL CLEAN WATER PROGRAM ENVIRONMENTAL IMPACT STATEMENT BY THE U.S. DEPARTMENT OF AGRICULTURE/SOIL CONSERVATION SERVICE WHICH ANALYZES ALTERNATIVE METHODS TO ADMINISTER THE RURAL CLEAN WATER PROGRAM WHICH PROVIDES FINANCIAL ASSISTANCE, SPECIAL TECHNICAL ASSISTANCE, AND COST SHARING TO RURAL LAND USERS APPLYING BEST MANAGEMENT PRACTICES TO IMPROVE WATER QUALITY.

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Troy E. Kern, President
Ark-Tex Council of Governments

ATTEST:

Bobby A. Ferguson, Secretary
Ark-Tex Council of Governments

CERTIFICATION

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF
A RESOLUTION OF THE COG MINUTES
DATED AUG 3 1978

EXECUTIVE DIRECTOR

RESOLUTION NO. 2029

RESOLUTION OF THE ARK-TEX COUNCIL OF GOVERNMENTS WITH REVIEW AND COMMENT ON A DRAFT RURAL CLEAN WATER PROGRAM ENVIRONMENTAL IMPACT STATEMENT BY THE U.S. DEPARTMENT OF AGRICULTURE/SOIL CONSERVATION SERVICE WHICH ANALYZES ALTERNATIVE METHODS TO ADMINISTER THE RURAL CLEAN WATER PROGRAM WHICH PROVIDES FINANCIAL ASSISTANCE, SPECIAL TECHNICAL ASSISTANCE, AND COST SHARING TO RURAL LAND USERS APPLYING BEST MANAGEMENT PRACTICES TO IMPROVE WATER QUALITY.

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Section 2 - That the above mentioned program is needed to improve water quality and utilize best possible land use management practices.

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Troy E. Kern, President
Ark-Tex Council of Governments

ATTEST:

Bobby F. Ferguson, Secretary
Ark-Tex Council of Governments

CERTIFICATION

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF

☐ COG MINUTES ..... Date

☒ RESOLUTION NO. ..... AUG 3 1978 Date

..... EXECUTIVE DIRECTOR

LEAGUE OF WOMEN VOTERS OF NORTH CAROLINA

2637 McDowell Street
Durham, N. C. 27705
Telephone: (919) 493-1178

RUTH MARY MEYER (MRS. J.H.)
President

August 8, 1978

Rural Clean Water Task Force

Soil Conservation Service
P.O. Box 1890
Washington, D.C.

Thank you for the opportunity to commenton the Environmental Impact Statement for the Rural Clean Water Program. We would like to restrict our comments to the overall alternatives and to the priorities and practices and not speak to the details of the analysis.

The alternative which appears to be within funding probabilities and gives the greatest prospect for success of a voluntary program is # V. However, the effectivenss of a voluntary program needscareful evaluation. It may not be an effective means of controlling pollution. A mandatory program, beginning with very large farm operations (above a given acreage to be determined on a regional basis) may well be necessary. Alternatives III and IV appear to be too arbitrary to apply on a nationwide basis. However on a regional basis they might be applicable.

The priorities listed do not give consideration to the farmland for which the funding is to be allocated. It would seem most beneficial to the country as a wnole to guide the funding to the best farmland.
It is imperative that federal programs be geared to the preservation of prime land for agricultural purposes. I question the economics of projects on land that is only marginally economic to farm - particularly where irrigation requirements result in salinity or where erosion is excessive. Such land should probably be converted to other uses or the farm operator assisted in relocation,

We strongly support the proposed limitation in practices to be cost-shared. In view of the continuing evidence of health impairment due to environmental contaminants, it is essential to focus on preventing the pollution of water with toxic materials in this program, and to avoid use of the funds for more general agricultural benefits.

Marion A. Nichol Chairman
Natural Resources

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
Olympia, Washington 98504 206/753-2800

August 11, 1978

Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221 - Souty Agriculture Bldg.
Post Office Box 2890
Washington, D.C. 20013

Dear Mr. Todd:

Thank you for the opportunity to review your draft environmental impact statement for the Rural Clean Water Program. As the states water resource agency, we read it with interest. You seem to have done a rather good job given the programmatic nature of the proposal.

Although we have no specific comments, we would appreciate a copy of your final EIS to use as we develop and implement Washington's program.

Sincerely,

T. L. Elwell
Environmental Review Section

TLE:bjw

cc: Mike Mills, OFM
Chuck Carelli, DOE

STATE OF WEST VIRGINIA
GOVERNOR'S OFFICE
OF
ECONOMIC AND COMMUNITY DEVELOPMENT
CHARLESTON 25305

JOHN D. ROCKEFELLER IV
GOVERNOR

DONALD D. MOYER
DIRECTOR

August 8, 1978

Mr. Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221 - South Agriculture Building
Post Office Box 2890
Washington, D.C. 20013

Dear Mr. Todd:

In response to your request of June, 1978, my staff has reviewed the draft Environmental Impact Statement (EIS) for the Rural Clean Water Program.

The EIS provides a good, comprehensive explanation of how the Federal Water Pollution Control Act Amendments of 1972 (PL92-500) complements the Rural Clean Water Program (RCWP). The RCWP seems to closely coordinate with the State of West Virginia's 208 Program. Our only comment is the missing figures on pages 18 and 21. I am sure your final report will contain these items in it.

If you have any questions on this, please contact me.

Sincerely,

Daniel S. Green, Manager
Program Support Services

DSG:ksb

STATE OF CALIFORNIA—RESOURCES AGENCY EDMUND G. BROWN JR., Governor

DEPARTMENT OF FORESTRY
1416 NINTH STREET
SACRAMENTO, CALIFORNIA 95814
(916) 445-5571

110

4900 RESOURCE STUDIES
4940 Water Quality
208 Study

August 11, 1978

R-18/8-11

Mr. Ernest Todd
Rural Clean Water Task Force
USDA Soil Conservation Service
P. O. Box 2890
Washington D. C. 20 13

Dear Mr. Todd:

This letter is in response to the Draft Environmental Impact Report for the Rural Clean Water Program (RWCP). Unfortunately, the California Department of Forestry is not on your mailing list and did not receive a copy of the Draft until just a few days before the comment deadline of August 11. As per my telephone call of August 9, thank you for extending this deadline date for our comments.

We have very quickly reviewed the report with California problems in mind and offer the following comments.

1. California has one of the top dollar producing agricultural industries in the world and a new program such as the RWCP will probably have a wide spread effect. We suggest that the Soil Conservation Service broaden its mailing lists to include more special and public interest groups in California.

2. Page 15, Silvicultural Activities, the six lines devoted to this subject are certainly not adequate consideration or evaluation of the problems which affect some of the most productive fish, wildlife, and watershed lands in our country - our forest lands.

   Nationally, harvested forest lands account for only about 11 million acres of land annually, the erosion potential per acre is 2.5 times greater for harvested forest land than it is for cropland.[1/]

1/ "Methods For Identifying and Evaluating The Nature and Extent of Non-Point Sources of Pollutants: EPA, 1973, Tables 2-1 and 2-2.

3. Page 7, Affected Environment; the thrust of this section illustrates the widespread water quality problems associated with cropland. In California, the majority of the streams and lakes are located in conifer forests and oak woodlands. I hope the thrust of this EIS can be redirected to provide adequate consideration of streams and lakes not located on cropland.

4. Page 15, Practices Cost-Shared; including other conservation practices with RCWP cost-shared practices can only reduce the effectiveness, reduce the participation, and confuse the issue. The goal of the RCWP is to improve water quality and not to condition cost-sharing on completion of a non-cost-shared practice.

5. Page 24, paragraph 2; does the 0.9 ton/ac./yr. soil loss figure for range and forest lands include losses from mass soil movement? Mass soil movement is a significant factor in forest lands in addition to sheet and rill erosion.

6. Page 24, paragraph 3; what happens to the other 50% of the soil loss not deposited in streams, flood plains, and reservoirs?

7. Page 26, Climate; the mean annual rainfall for California ranges from about 4 inches to 120 inches.[2/] The range stated for the western states of 8 to 16 inches or less is extremely misleading to the uninformed public.

   We are in total agreement that rainfall significantly influences the magnitude of NPS effects on water quality. The rainfall on California's 42.4 million acres of commercial and non-commercial forest land, a factor excluded from consideration, ranges between approximately 10 and 120 inches per year. The range exceeds that reported for the western states by a significant amount.

8. Page 56, Unavoidable Adverse Effects; it is our understanding that 25% of the 1975 Long Term Agreements approved in California have been terminated before completion. Careful consideration should be given before utilizing the exact same program guidelines for RCWP as were used for the 1975 LTA program.

   The "slight loss of managerial discretion" may be greatly understated if the 1975 program guidelines are followed. Flexibility and lack of management discretion have taken a toll on the 1975 LTA program. The RCWP must be structured to allow for flexibility and management discretion.

9. Page 57, Possible Conflicts; agreements under the RCWP which require practices which "substantially reduce" income will be designed for failure.

2/ "Mean Annual Precipitation in the California Regions" U. S. Department of the Interior Geological Survey, Water Resources Division, 1972.

In conclusion, it appears that the control of NPS pollution may be adequately addressed as it relates to cropland; however, the report leads us to believe that cost-share money may never reach the non-cropland NPS pollution problem areas in sufficient amounts to meet the intent of PL 92-500.

Please place the following on your mailing list:

1. L. A. Moran, Director
   Department of Forestry
   1416 Ninth Street
   Sacramento, CA 95814
   (916) 445-3976

2. Deni Green, Director
   Office of Planning and Research
   State Clearinghouse
   1400 Tenth Street
   Sacramento, CA 95814
   (916) 445-0613

Sincerely,

Jonathan E. Rea

Jonathan E. Rea
208 Asst. Project Coordinator

jj
cc: Mark Rey N.F.P.A.

iowa department of environmental quality

reply to: Ubbo Agena
phone: 515/281-8952

August 9, 1978

Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221 - South Agriculture Bldg.
P.O. Box 2890
Washington, D.C. 20013

RE: Draft Environmental Impact Statement for Rural Clean Water Program

Dear Mr. Todd:

This letter is sent to forward the comments of the Iowa Department of Environmental Quality on the draft environmental impact statement prepared for the Rural Clean Water Program. Our agency appreciates the opportunity to review this statement and offers the following comments:

1. We believe the scope of analysis should be expanded to include additional funding levels under Alternatives 3, 4 and 5. Additional analysis at different funding levels should provide information on the relative benefits to be derived from incremental increases in funding. This information would be of significant value in determining what level of funding should be appropriated for the Rural Clean Water Program.

2. The national estimate of eight to fifteen billion dollars expenditure for Alternative 2 appears low. It has been estimated that control of soil erosion alone in Iowa will cost over two billion dollars. Although the control of nonpoint pollution for water quality purposes is significantly different than soil erosion control, nonpoint pollution control also includes many items which are not covered in soil erosion control estimates. Because of the inclusion of such things as pesticide and nutrient control and animal waste control in the nonpoint pollution control efforts, it appears that the national estimate is extremely low.

3. Several of the statements contained under the section "Program Alternatives" on Pages 6 and 7 appear inconsistent with statements made under the section "Environmental Consequences" on Page 8.

   Under Alternative II on Page 6, it is indicated that sufficient expenditures would be provided to adequately treat most significant nonpoint pollution sources on private rural lands. On Page 8, the review of Alternative II indicates that about 45% of the total nonpoint water pollution problem originating on private lands would be improved. We question why, if Alternative II is treating most nonpoint problems, the estimate on Page 8 indicates that only 45% of the problem will be improved to meet national water quality goals.

In the review of Alternatives III, IV and V on Pages 6 and 7, estimates are given on the percent of the nonpoint source areas treated by each Alternative. Similarly, Page 8 includes estimates of the percent of the total nonpoint problem that would be improved under each Alternative. Comparison of these percentages raises questions as to the accuracy of the estimates. For example, the review of Alternative III on Page 6 indicates that approximately 30% of the areas treated in Alternative II would be treated under Alternative III. On Page 8, the Alternative III review indicates that about 35% of the total nonpoint problem would be improved to meet water quality goals. When this latter figure is compared with the 45 percent estimate given on Page 8 for Alternative II, this estimate indicates that spending only 20% of the Alternative II expenditure in accordance with the Alternative III policy would result in achieving nearly 80% of the potential Alternative II improvement.

4. As presently worded, the fourth sentence in the second paragraph of the section "Affected Environment" on Page 7 appears to imply that all pesticides and nutrients are used improperly. We suggest revision of the sentence to remove this implication.

5. The average soil loss per acre is projected to increase from the present to the year 2000. In reviewing the report, we do not find adequate explanation for this projected increase in soil loss and believe such justification should be provided.

6. The EIS indicates that average soil loss rates are projected to increase by the year 2000 for Alternatives I, IV and V. Because of this projected increase in average soil loss, we question the accuracy of the predicted environmental consequences of implementing these Alternatives. For example, we question whether implementation of Alternative V can result in control of 30% of the total nonpoint source problem when average soil loss rates are, in fact, increasing.

7. We believe the word "not" should be deleted from the last sentence of Item 3 under "Major Conclusions" on Page 10.

8. If possible, we believe the EIS should draw on more recent studies on pesticide contamination of water than studies from 1964 through 1968 (as indicated in the second paragraph of Page 17). Since increased used of pesticides and considerable changes in pesticide formulation have occurred since that period, use of more recent studies appears appropriate.

9. The last sentence on Page 28 indicates that most feedlots are classified as point sources by the Environmental Protection Agency. We do not consider this to be the case, since the adopted EPA regulations require only a small percentage of the total number of animal feeding operations to obtain permits and, in fact, exclude the majority of operations from permit requirements. Therefore, most animal feeding operations should be classified as nonpoint sources.

10. For practice P-13 on Page 35, we question whether this practice can be used only where authorized. It is our understanding that although higher pesticide application rates cannot be used unless specific authorization is received, no such authorization is required for lower application rates.

11. We are unclear as to the intent of practice P-15 on Page 35 and believe further clarification of this practice should be provided.

12. The second paragraph under the review of Alternative III on Page 45 states that approximately 50% of the streams with nonpoint pollution problems would be improved. This conflicts with earlier statements which project that Alternative III would improve 35% of the streams with nonpoint problems.

13. In the review of economic effects (beginning on Page 51), no mention is made of the economic effects on the landowner as a result of the initial and maintenance costs incurred due to adoption of best management practices. Since such economic effects may be a major factor in determining the degree of success of the Rural Clean Water Program, the EIS should include a review of the economic effects on landowners.

The above concludes this agency's comments on this draft environmental impact statement. We appreciate consideration of these comments in review and finalization of this statement.

Sincerely,

CHEMICALS AND WATER QUALITY DIVISION

Ubbo Agena, P.E.
Planning Section

UA:pls

COLORADO STATE SOIL CONSERVATION BOARD
618A State Centennial Building
1313 Sherman Street
Denver, Colorado 80203
Phone 839-3351

Richard D. Lamm
Governor

Allen J. Campbell
Director

August 9, 1978

To: R. M. Davis, Administrator
Soil Conservation Service
U.S.D.A
Washington, D.C. 20250

From: Allen J. Campbell, Director
Colorado State Soil Conservation Board
1313 Sherman Street
Denver, Colorado 80203

Subject: Comment on EIS for Rural Clean Water Program

Dear Mr. Davis:

We have received your EIS for the RCWP. We congratulate you on a very fine document.

We believe alternative V is the best approach to solve rural water quality problems. This alternative recognizes only the most critical water quality project areas where local interest and project design provide for a high degree of success probability.

We have no adverse comments concerning the document.

Sincerely,

Allen J. Campbell

Environmental Defense Fund

1525 18th Street, NW, Washington, D.C. 20036 • 202/833-14

August 11, 1978

Mr. Ernest Todd
Rural Clean Water Task Force
Soil Conservation Service
P. O. Box 2890
Washington, D.C. 20013

RE: Draft EIS/Rural Clean Water Program

Dear Mr. Todd:

I submit herewith the comments of the Environmental Defense Fund on the draft EIS for the Rural Clean Water Program, which are due today.

I would very much appreciate the opportunity to discuss with you and other members of the Rural Clean Water Task Force our ideas about the program. As our comments indicate, we think the present strategy for implementing it leaves much to be desired.

Very truly yours,

Edward Thompson, Jr.
Washington Counsel

encl.

Comments of the Environmental Defense Fund
On the Rural Clean Water Program Draft EIS

The challenge of the Rural Clean Water Program (RCWP) is to distribute a limited amount of federal money in such a way that it will do the most good in terms of improving water quality by reducing agricultural nonpoint source (NPS) pollution. The success or failure of the program will hinge on the ability of USDA to direct the money where it is most needed, and this in turn will depend upon the criteria adopted by the agency to determine funding priorities.

The criteria described in the draft EIS for the RCWP are unclear, cryptic and superficial. They are hardly calculated to serve as a meaningful guide to program administrators, from local soil conservation district officers to USDA itself, in establishing funding priorities. Absent clear and definitive criteria, we fear that the RCWP could eventually repeat the shortcomings of the SCS and ASCS soil conservation programs criticized by the General Accounting Office in its report entitled "To Protect

Tomorrow's Food Supply, Soil Conservation Needs 119
Priority Attention," February, 1977.

In order for the RCWP to fulfill its promise and potential, it should address the question of funding priorities from three perspectives, in decreasing order of magnitude:

1. Which watersheds should receive priority funding because of their NPS pollution problems?

2. Within selected watersheds, which specific agricultural lands and operations should receive priority funding?

3. On selected agricultural lands and operations, which best management practices (BMP) should receive priority funding?

The draft EIS appears to deal only with the first question, and then in only a superficial way. It glosses over the other two questions -- which are perhaps of even greater importance -- by citing the difficulty of drawing general conclusions about which BMP are most appropriate for specific agricultural operations.

The Question of Watershed Priorities 120

The draft EIS appears to focus on two criteria for determining which watersheds have the most "critical nonpoint source pollution problem," in the words of the Senate Report on the Clean Water Act of 1977, at 36. Alternative III apparently would concentrate on cleaning up watersheds where specific agricultural NPS pollutants are found, whereas Alternative IV would concentrate on those watersheds with the greatest cumulative agricultural NPS pollution load regardless of the specific pollutants contributing to the problem. The draft goes on to suggest that USDA leans toward yet another implementation strategy, Alternative V, which would somehow combine the criteria of III and IV in determining funding priorities, and add a third criteria -- degree of "local interest."

Both the specific pollutant and the cumulative load approaches appear to be valid criteria, but the draft EIS offers no basis upon which their relative merits can be evaluated. Moreover, the discussion

of Alternative III begs the question of which agricultural NPS pollutants should first be addressed by the RCWP because of their relative threats to human health, fish and wildlife populations or recreation opportunities. For example, should funding be directed as a first priority into watersheds where pesticides are the principal problem or where sediment is the chief concern? 121

Alternative V effectively glosses over these distinctions. It further compounds the uncertainty over criteria by adding a dose of the ingredient "local interest," which seems to imply that funding priorities will ultimately be determined by which farm operators first approach USDA. In short, the approach to establishing criteria for funding priorities manifested by the draft EIS is all but meaningless -- the document calls it "flexible" -- as a mechanism by which to ensure that, indeed, those watersheds with the most critical NPS pollution problems receive priority funding.

The Question of Priorities Among Agricultural Lands and Operations 122

Once USDA determines, on the basis of sound criteria now missing from the program, that certain watersheds should receive priority funding because of their agricultural NPS pollution problems, it will remain for the agency to decide which agricultural lands and operations within those watersheds should get funding priority. The draft EIS indicates that this question will be left up to the local operators who comprise the RCWP committee -- who may thus serve as judges in their own cause -- and state officials. Yet the document offers no criteria to guide them in the exercise of their discretion.

The RCWP is presumably calculated by be an incentive for agricultural operators to install BMP, where they otherwise might not choose to or be able to do so. In other words, the program is designed to supplement the ability of operators to contribute to the goal of clean water. As such, the relationship between the RCWP and other water pollution control and agricultural programs should be explained as the first step in determining

when the RCWP will, in fact, serve as an effective incentive to operators. 123

For example, the draft EIS fails to address the relationship between the RCWP and the 208 program in general. Under section 208(b)(2)(F)of the Clean Water Act, local water quality management agencies must adopt procedures for controlling agricultural NPS pollution through the application of BMP. Although the nature of the procedures is left up to the local officials, regulation or other sanctions are clearly permissible to compel agricultural operators to comply with the 208 plans. This raises the question of whether agricultural operators who are financially able to install BMP, as required by local officials, should receive RCWP funds for this purpose to the exclusion of another operator who may not be as well able to do so. While, as the draft EIS suggests, questions such as this may be better answered at the local level, USDA should attempt to provide some guidance so that RCWP funds are used to maximize improvement of water quality.

The RCWP should further be examined in light of other USDA programs such as those of SCS and ASCS, which provide funds and technical assistance to agricultural operators for purposes of soil conservation. The GAO criticized the operation of some of these programs on the grounds that funds were being used primarily to increase cropland production rather than for soil conservation, essentially because of the preference of agricultural operators for the former. This raises the question of whether agricultural operators who have received or continue to receive, funds and technical assistance for production oriented measures to the exclusion of soil conservation measures, should now be able to avail themselves of RCWP funds for NPS pollution abatement. Again, the effectiveness of RCWP as an incentive to operators will depend in part on its relationship to the other agricultural programs, and this relationship should be examined by USDA in formulating guidelines for local program administrators. 124

Finally, the RCWP should be viewed in the light of still other agricultural programs, such as crop allotment schemes and crop disaster insurance. The GAO found that these programs

have worked at cross purposes with soil conser- 125
vation programs, either by offering a counter-
incentive to the installation of BMP or by
eliminating the incentive altogether. By
extension, the same argument would apply to
the RCWP.

In summary, the effectiveness of the RCWP as an incentive to operators -- and thus the success of the program itself -- will depend in significant part upon its relationship to other water pollution and agricultural programs. These relationships should be examined in the EIS. Cf., Cape Henry Bird Club v. Laird, 359 F. Supp. 404 (W.D. Va 1973); Prince Georges County v. Holloway, 404 F. Supp. 1181 (D.D.C. 1975).

The Question of Priorities Among BMP

After USDA and state and local officials determine which watersheds and agricultural operations should receive priority funding, the final decisionmaking step will be to decide which BMP should be applied to the selected lands within the watersheds. Again, this matter is left up to local administrators but without criteria to

guide them, beyond the statutory requirement 126
that BMP be certified as consistent with an
approved 208 plan.

The draft EIS implies that certain BMP are more effective than others in abating agricultural NPS pollution. But it makes no attempt to draw general conclusions as to the relative effectiveness of various BMP -- as it certainly should, if the RCWP is to maximize its effectiveness.

Some practices are in themselves more likely to abate agricultural NPS pollution than others. For example, the use of alternative controls is more likely to reduce pesticide NPS pollution than is the simple reduction of the rate of pesticide application. Source controls in general are likely to be more effective than transport controls. Some BMP may be more effective than others when applied to agricultural lands having certain characteristics, e.g., topography, soil type, climate and crop being produced.

This raises the question of whether a particular BMP should be approved for RCWP funding, if there exists a better BMP in

terms of effectiveness in abating a given agricultural NPS pollutant. (Indeed, the real question is whether a so-called BMP is, in fact, the best management practice that can be applied under the circumstances.) USDA should develop a hierarchy of BMP to serve as criteria -- albeit flexible ones -- for determining funding priorities. 127

Respectfully,

Edward Thompson, Jr.

unded 1875 AMERICAN FORESTRY ASSOCIATION balanced forest use 1319 Eighteenth Street NW Washington DC 20036 telephone (202) 467-5810

July 7, 1978

Mr. Ernest V. Todd
Task Force Leader
Rural Clean Water Program
Soil Conservation Service
Department of Agriculture
Washington, D. C. 20250

Dear Mr. Todd:

The American Forestry Association has little to offer in the way of comments on the Draft EIS for the Rural Clean Water Program. There is very little application to effects on forestry or forestry-related pollution.

The map on page 22-E (Figure 9) would imply that silvicultural activities do not affect many areas of the country. We find this interesting in terms of forestry and water quality. A natural question would be--Does this reflect lack of forestry-related pollution or a lack of information? Several years ago, we conducted a series of regional workshops for EPA on forestry activities and related water quality. You may be interested in a copy of the final report we made to EPA (enclosed).

Sincerely,

William E. Towell
Executive Vice President

enclosure

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technology
Washington, D.C. 20230
(202) 377-3111

August 11, 1978

Mr. Ernest V. Todd
Task Force Leader
Soil Conservation Service, Rm. 5221
P.O. Box 2890 South Agriculture Bldg.
Washington, D.C. 20013

Dear Mr. Todd,

This is in reference to your draft environmental impact statement entitled, "Rural Clean Water Program." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. **We would appreciate receiving six copies of the final statement.**

Sincerely,

Sidney R. Galler

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure: Memo from:
NOAA-National Marine Fisheries Service

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Duval Building
9450 Koger Boulevard
St. Petersburg, FL 33702

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July 24, 1978

TO: Director
Office of Ecology and Environmental Conservation, EE

THRU: Associate Director for Resource Management, F3

FROM: William H. Stevenson
Regional Director

SUBJECT: Review of DEIS No. 7806.29 - Rural Clean Water Program (SCS)

The Draft environmental Impact Statement on the Rural Clean Water Program that accompanied your July 11, 1978, memorandum has been received by the National Marine Fisheries Service for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

General Comments

The DEIS lacks sufficient detailed information on which to judge environmental impacts on fishery resources. If site specific EIS's are planned once the program has been selected, the programmatic FEIS should so specify.

Figures 1, 2, 3, 4, 14, 15, 16, and 17 listed in the table of contents were omitted in the text. Also, Figure 18 was not labeled as such in the text.

Specific Comments

Major Conclusions

Page 10-11. We believe that the major conclusions are important and, therefore, should be discussed in more detail. For example, under No. 1 the beneficial effects on the natural environment and the indirect benefits to people should be listed; under No. 3, the last sentence should be explained; and under No. 5, item A., examples of the structural measures should be given.

July 5, 1978

Ernest V Todd
Task Force Leader
Soil Conservation Service
Rm. 5221 So. Argiculture Building
P.O. Box 2890
Washington, DC 20013

Dear Mr. Todd:

I have reviewed the draft program EIS on the Rural Clean Water Program. My comments are as follows:

1. On page 13, line 1, change if to where. This change is in keeping with the basic legislative language and is indicative that the determination will be made on a case-by-case basis, rather than on the program as a whole.

2. On page 15, under Silviculture activities, line 3: Change on to from. This change is indicative of the "source to receiving waters" relationships.

3. Page 22-D, figure 8: The most extreme upper right-hand corner of the map should be shaded. From my experience in the St. John River Valley, I know that this basin, and especially the Aroostook River sub-basin, is affected by pollution from agricultural activities.

4. Page 26, Energy, last line: Strike the word to.

Your consideration of these suggestions will be appreciated.

Sincerely,

Charlie

Charles L. Boothby
Director of Public Affairs

National Association of Conservation Districts
Rm. 1105, 1025 Vermont Ave., N.W., Washington, D.C. 20005
202/347-5995

MEMORANDUM

June 28, 1978

TO: Ernest V. Todd, Task Force Leader
Rural Clean Water Program
Soil Conservation Service

FROM: Paul Dettman, Senior Management Planner
NOACA

RE: Rural Clean Water Program Draft Environmental Impact Statement

An analysis of the Soil Conservation Service's Draft Environmental Impact Statement (EIS) on the Rural Clean Water Program leads to a positive evaluation of its adequacy both as an assessment of the environmental impact of implementing the Rural Clean Water Program and as a document prepared to fulfill the requirements of the National Environmental Policy Act of 1969. The bases for this positive evaluation are the following:

1. The environmental impacts of various alternative implementation strategies, not just the strategy most likely to be followed, are examined.

2. Impacts are assessed for the significant variables in both the natural and social environments.

3. Impacts, based upon the findings of previous research, are clearly stated and, whenever possible, quantified.

4. Negative as well as positive impacts are included and gaps in knowledge are frankly admitted, with the result that the EIS does not take the form of a "sales pitch" for the Program.

5. The EIS is formulated in terms of the details of the Program, including BMP's which abate agricultural water pollution, rather than in terms of a general programmatic outline.

For the above reasons, the Draft EIS is admirably suited to serve its purpose, which, in the words of the Introduction, is to provide a basis for "making decisions on further program development." In this connection, the Draft EIS identifies Alternative V as the implementation strategy most likely to be followed. While it would not be in order for an areawide 208 agency to take a position on the way in which the Rural Clean Water Program should be carried out nation-wide, the Soil Conservation Service could profit from knowing that, if it opts for Alternative V, that Alternative could be implemented effectively within the NOACA 208 planning area.

cc: G. Stem

UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

JUL 18 1978

OFFICE OF EQUAL OPPORTUNITY

IN REPLY REFER TO: 8140 Supplement 8

SUBJECT: Draft Environmental Impact Statement for the USDA Rural Clean Water Program

TO: Ernest V. Todd
Task Force Leader
Soil Conservation Service

We have reviewed your Draft Environmental Impact Statement (EIS) for the Rural Clean Water Program and have no civil rights recommendations to make.

Thank you for allowing us to comment on this statement.

JAMES FRAZIER
Director

OHIO DEPARTMENT OF AGRICULTURE

JOHN M. STACKHOUSE
Director

65 South Front Street
Columbus, Ohio 43215

JAMES A. RHODES
Governor

July 21, 1978

Ernest V. Todd
Task Force Leader
Soil Conservation Service
Room 5221, S. Agriculture Bldg.
P.O. Box 2890
Washington, D.C. 20013

Dear Mr. Todd:

The following are areas of concern which I have with the draft program environmental impact statement for the implementation of P.L. 92-500 and P.L. 95-217.

Page 7 - Affected Environment. There are some serious mis-representations in this section of the report. This is an environmental impact statement for the implementation of the two above mentioned laws. As such the section sets forth the broad baselines upon which problems are purported to exist.

The section states that of the 363 Million acres of cropland, there are 65-75 Million acres which need conservation treatment for sediment control purposes. It goes on to state that 200-250 Million acres need treatment for pesticide and nutrient control. This second statement is simply not true. It has long been known that with the exception of nitrogen, nutrients and pesticides quickly become attached to the soil particles and do not move, unless the soil particles move. Nitrogen in the ammonia form acts in the same manner. Nitrate Nitrogen is water soluable and can move down through soil with drainage water. The only nitrogen which would move off over the soil surface would be that applied to frozen soil. This has never been a common practice and with current prices of Nitrogen this is not apt to become a common practice. If you will look at the acres of cropland in the U.S. which SCS says needs drainage, I think you will agree that nitrate leaching is not a problem on much of the cropland. On these acres the nitrogen is lost through denitrification long before it leaches into underground water. It then follows that nutrient and pesticide problems would only be a potential problems on the 65-75 Million acres where sediment control problems exist. The only exception to this would be nitrate nitrogen on well drained soils.

This section goes on to state that all the nutrients (49 Million tons of commercial fertilizer) and all the pesticides (750,000 tons) "that are used improperly on cropland" can adversely affect water quality. This statement is false and misleading also. Most of the fertilizer and pesticides are used according to recommended agronomic practices and do not have a negative impact on the environment.

This whole section needs to be corrected before the EIS is adopted. It is inaccurate and does not correctly address the extent of agricultures true environmental impact on nutrient and pesticide concerns.

Page 14 - Adequate Participation. The concept of adequate participation (75%) "before contracts are made" is not realistic. It will be almost impossible to get 75% participation without making a commitment on the part of the management or funding agency. This implementation requirement seems to me to be a bureaucratic roadblock designed to assure that voluntary programs will not succeed.

I realize that this is an environmental impact statement and not a plan of action or regulation, however, as an environmental impact statement, it does set forth broad areas where problems exist and need to be addressed. I believe that there is not evidence to support statements which are in the report and therefore it needs to be corrected.

If there are questions, I will be glad to discuss them with you.

Sincerely yours,

OHIO DEPARTMENT OF AGRICULTURE

John M. Stackhouse
Director

JMS:abq

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

11 AUG 1978

OFFICE OF THE
ADMINISTRATOR

Mr. Ernest V. Todd
Task Force Leader
Rural Clean Water Program
U.S. Department of Agriculture
Soil Conservation Service
Washington, D.C. 20250

Dear Mr. Todd:

In accordance with its responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, the Environmental Protection Agency has reviewed the draft environmental impact statement (EIS) for the Rural Clean Water Program.

Our review has not identified any areas of major concern and we have categorized the EIS as Lack of Objections--Adequate (LO-1). Definitions of the categories are provided on the attachment. The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act.

Although we have no major objections, there are four areas which we believe could be improved to provide a strengthened final EIS and, therefore, a stronger program implementation guidance. These four areas are in addition to our editorial comments previously transmitted to Gary Margheim on an informal basis.

1. Discussion of the effects on the agricultural community infrastructure should be expanded. The positive socio-economic impacts of the development of the RCWP should be a major point of the EIS and program implementation. It is our view that this program would result in improvement of the quality of the Nation's waters while continuing and expanding the Nation's ability to produce food and fiber.

2. We believe the information on pesticides and nutrients and their impacts on water quality is not as highly developed as it should be. We are aware, however, of the continuing development of studies, tests, and techniques which will have a major impact on the control of these potential pollutants through the RCWP. We recommend that, as the program is implemented and the National Rural Clean Water Coordinating Committee is established, a specific nutrient/pesticides task group be appointed to advise the Committee on appropriate actions regarding nutrients and pesticides. The primary purpose of the task group would be to keep the NCWCC abreast of the latest available techniques to control nutrient/pesticide water quality problems in the most cost-effective manner and to advise the Committee on the appropriate use of those techniques. This or a similar structure may also be incorporated in the state committees as well.

3. Additional discussion on the protection of wetlands in project areas should be included. While we are aware that the proposed regulations for implementation of the RCWP call for no cost sharing for those projects that would entail: 1) a change in land use, i.e. bringing additional land into production, 2) drainage for increasing production, or 3) flood protection, i.e. reservoirs or channelization, this portion of the EIS should be expanded to bring these issues into sharper focus.

4. In consideration of the magnitude of the program, and realizing that full funding will not be forthcoming in the very near future, we would like to offer the following suggestion. As the program evaluation is undertaken, it may be advisable to include a comparative analysis of areas where good water quality is being maintained and similar areas where water pollution problems are being addressed through the RCWP. This comparative analysis would help demonstrate which long term, cost-effective practices have the most beneficial impact on water quality.

We appreciate the opportunity to review this Draft EIS and hope that our comments are of use to you in the preparation of the final EIS. Please contact us if you have any questions regarding our comments or if we may be of any further assistance.

Sincerely yours,

William D. Dickerson
Acting Director
Office of Federal Activities (A-104)

STATE OF NEW MEXICO
NATURAL RESOURCES DEPARTMENT
FORESTRY DIVISION
P.O. BOX 2167 SANTA FE 87503
827-2312

JERRY APODACA
GOVERNOR
WILLIAM S. HUEY
SECRETARY
OF NATURAL RESOURCES

RAYMOND R. GALLEGOS
STATE FORESTER

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S - COOPERATION
SCS

July 11, 1978

Mr. R.M. Davis, Administrator
USDA, Soil Conservation Service
P.O. Box 2890
Washington, D.C. 20013

ATTN: Mr. Ernest Todd, Rural Clean Water Task Force

Dear Sir:

Through the auspices of Mr. Philip L. Thornton, Deputy Chief of the Forest Service, we have had the opportunity to briefly review the Draft Environmental Impact Statement for the Rural Clean Water Program, June 16, 1978. Following are comments that we believe will be useful in review of the EIS and in strengthening the overall Rural Clean Water Program:

1. We are concerned that the meager recognition of silvicultural activities, page 13, will make it difficult to obtain Rural Clean Water Program funds as needed to implement silvicultural BMP's. We feel that the short, three sentence, statement in the draft EIS text is not in consonance with Table 4.-- Relative total erosion from various land uses. The table indicates that undisturbed private forest land and harvested forests make up 6% of total relative erosion. Note that Table 2 indicates that, combined, forest and range land yields 10% of total sediment, nationally.

Admittedly, these are small portions of the total, however, we feel that silviculture warrents greater development in the EIS text.

2. We agree that Alternative V may be the best choice of program direction. However, before final selection of any Alternative, we urge close consideration of Alternative III - particularly because it" ....would appear to benefit the greatest number of water users in the United States." In addition, Alternative III has the same net relative effects as Alternative II, (Table 1.).

3. Figure 11, Display of Alternatives, indicates that when all dollars are expended - over time - the same amount of water quality improvement will be effected. It seems that a dimension of time should be added so that a reviewer might observe the rate of expenditures over time. The figure, as drawn, infers that Alternative II might have the most even distribution of funds expended and consequently would be the easiest program to plan, ie: Y$+ (inflation) each year for X years.

4. The analysis of economic effects (page 51) is a bit confusing:

   a. The economic impact of Alternative I is not presented.

   b. Cost data presented in the analysis of Alternatives II through V seem to reflect only program costs to be borne by Rural Clean Water Program appropriations. A fundamental question that needs an answer will be posed by landowners and operators, and does not seem to be assessed in the EIS: that is "how much will it cost me?" The analysis of Alternative II indicates "... The practices would have no significant impact on gross returns to individual operators, but would increase their production costs by at least the cost of installing the BMP's." It seems that an individual operator would want to know what these costs are in order to pass them on to consumers, enabling the continuance of a reasonable profit.

Thank you for the opportunity to review the draft EIS, and your attention to our comments.

Sincerely,

Raymond R. Gallegos
State Forester

RRG/ms
cc: Bill Troxel, USFS, R-3
Jim Eggleston, USFS, WO
Harry Taylor, USFS, R-2
Tom Borden, CO, St. Forester

The Fertilizer Institute
1015 18th Street, N.W.
Washington, D.C. 20036
(202) 466-2700 • Telex 89-2699

EDWIN M. WHEELER
President

July 31, 1978

Mr. P. M. Davis
Administrator
Soil Conservation Service
U.S. Department of Agriculture
Washington, D.C. 20013

Dear Mr. Davis:

The Fertilizer Institute has reviewed the Draft Environmental Impact Statement on the Rural Clean Water Program and has discussed it with a member of the SCS Rural Clean Water Task Force. I realize your staff has prepared this draft under a serious time limitation, and the statement, as a whole, deserves commendation.

Several points, however, are particularly noteworthy and, by this letter, I am respectfully asking that special attention be given to the following:

1. Page 7. The statement, "Large quantities of pesticides and nutrients that are used improperly on cropland could adversely affect water quality" is largely an erroneous speculation. To my knowledge it is not substantiated by any information of USDA. Conversely, farmers use these materials with considerable care. The fact that these materials do not fit precisely unique field conditions, which are inherently quite variable, does not mean that the use is improper. Diagnostic tools such as soil testing and plant analysis are being used extensively by farmers and the quoted statement should be deleted. The statement is grossly inaccurate and unfair to the current managerial level and efforts of U.S. farmers to fit inputs as closely as possible with actual needs.

Secondly, the statement that lands managed for intensive crop and livestock production usually provide the greatest "rates of pollution" is inaccurate. Exceptions can be cited for nearly every case, but I do not believe evidence of USDA's research will support this charge.

2. Page 8. Reference is made to "nutrient control." The term "nutrient management," such as used on page 27 is much more appropriate, and I recommend use of the latter.

3. Page 17. Data cited on nutrients deserve close review. One item obviously in error is the figure of 75 percent for farmer-use of fertilizers. Recent surveys by the Association of American Plant Food Control Officials show that non-farm use is only about three percent of the total fertilizer use. A copy of the most recent survey on this point is enclosed.

4. Pages 36 and 37. Soil testing and plant analysis should be included in this list. They are the best diagnostic tools for determining fertilizer needs and, in a sense, are BMPs themselves. Also, the expression "management" is more appropriate than "control."

We have identified only several points which deserve corrections or additions, and we submit the above recommendations for the purpose of constructive improvement. If there is any way we can provide additional assistance or information, please contact me.

Sincerely,

Edwin M. Wheeler

EMW:pab
Enclosure

ROBERT W. STRAUB
GOVERNOR

Forestry Department
OFFICE OF STATE FORESTER
2600 STATE STREET, SALEM, OREGON 97310 PHONE 378-2560

August 10, 1978

Mr. Edward E. Thomas
Assistant Administrator
Land Resources
Soil Conservation Service
P. O. Box 2890
Washington, D. C. 20013

Dear Mr. Thomas:

The Oregon State Forestry Department has reviewed the draft environmental impact statement for the Rural Clean Water Plan (RCWP) and proposed rules and regulations for the same program. We have consistently supported the Federal Water Pollution Control Act and the 208 program in Oregon, and we view the RCWP with considerable interest. In our review, we note that the RCWP procedures do not preclude funds from being used for application of BMP in forested lands. Our concern for this arrangement is relatively minor and relates to our own substantial involvement in establishing BMP's for forest lands in Oregon through the Oregon Forest Practices Act. We feel that decision bodies should be aware of the substantive effort that has gone forth here and in other states to implement meaningful forest practices programs with demonstrable results. Beneficial effects of RCWP, we feel, should not be impinged by allocating scarce resources in the duplication of effort so recently expended on a parallel program for forest lands and silvicultural practices.

It is perhaps not necessary to comment on this matter, but we feel that any administrative effort of the RCWP should clearly recognize previous accomplishments in the development of silvicultural BMP's and take full advantage of this effort.

Thank you for this opportunity to comment on this program, and proposed rules.

Very truly yours,

J. E. SCHROEDER, State Forester

By Neil T. Skill
Neil T. Skill, Director
Forest Practices Section
Forest Protection Division

NTS:ab

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

144

Intergovernmental Relations Division
Room 306, State Library Building
Salem, Oregon 97310, Phone: 378-3732

PNRS STATE REVIEW 04

Project #: 4 Due Date: _____

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have no comment and the file will be closed.

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

( ) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

( ) It has adverse effects.

( ) We are interested but require more information to evaluate the proposal.

( ) Please coordinate the implementation of the proposal with us.

(X) Additional comments for project improvement. (Attach if necessary)

- - - - - - - - - -

REMARKS (Please type or print legibly)

Comments are attached.

Agency DEPARTMENT OF FISH AND WILDLIFE I. C. By William E. Pitney

ENVIRONMENTAL MANAGEMENT SECTION 8/3/78

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

145

Intergovernmental Relations Division
240 Cottage Street S.E., Salem, Oregon 97310
Phone: 378-3732

STATE A-95 REVIEW ADDENDUM

APPLICANT: Soil Conservation Service

PROJECT TITLE: Rural Clean Water Pgm

PNRS #: 7807 4 180

DATE : August 11, 1978

The State Clearinghouse has received additional comments from Fish & Wildlife subsequent to our conclusion letter of August 8, 1978, please see copy(ies) attached for your attention.

Additional Clearinghouse comments:

(X) Please consider this letter and enclosure(s) an addendum to our previous letter.

(X) A copy of this letter and enclosure(s) should be forwarded to the federal funding agency as required by OMB A-95.

If you have questions please contact the State Clearinghouse at the above address and telephone number.

OREGON DEPARTMENT OF FISH AND WILDLIFE

comments on

Draft Environmental Impact Statement

for the

Rural Clean Water Program
Soil Conservation Service

PNRS 7807-4-180

The Draft Environmental Impact Statement (DEIS) for the Rural Clean Water Program is very general and offers little specific information about the projects that could be implemented. It is impossible to assess the fish and wildlife impacts as few data and references are provided. The final statement should include a comprehensive description of the alternatives and describe how each proposal would be implemented.

Alternative II would provide the most benefits but it is unlikely that an expenditure of $8 to $15 billion would be authorized. The DEIS states that "Alternative III would appear to have the greatest beneficial effects to fish and wildlife per unit expenditure of RCWP funds." From the description, it appears that Alternative V may have the best possibility of achieving some degree of success.

We urge that all projects which may result from this program be coordinated with the state and federal fish and wildlife agencies in the appropriate areas. This would be essential to adequately assess the resource impacts and develop compensatory measures for identified problems. Prioritizing the best management practices to be used for land treatments should also be coordinated with the fish and wildlife agencies.

Following are some specific comments that should be addressed in the final document:

1. The DEIS program objectives should place greater emphasis on soil erosion and sediment control.

2. Non-structural stream treatments should be used wherever possible before considering any instream structures.

3. A positive testing and monitoring program should be established to evaluate and document fish resource enhancements brought about by project expenditures.

4. Problems other than sediments, nutrients, and toxic substances are important and should receive more attention in the final statement. An adequate streamside vegetation program can reduce water temperatures and bank erosion. The improvement of these factors would greatly benefit the water quality of many eastern Oregon streams.

The Rural Clean Water Program can provide economically practical means to resolve many water quality problems due to non-point pollution sources, providing project selection and fund allocation decisions are properly made.

ANALYSIS OF PUBLIC COMMENT

INTRODUCTION

The following section is a response to substantive public comments received on the draft EIS. In addition, many comments received from other USDA agencies were considered in preparing the final EIS. For brevity and easy reference, comments have been paraphrased and organized according to subject matter.

ALTERNATIVES

Comment: Figure 11 of the draft EIS purports to show the relative benefits of the various alternatives. The extent to which Figure 11 accurately portrays the relative benefits of the alternatives is questioned. (Arkansas Department of Pollution Control and Ecology; New Mexico Natural Resources Department)

Response: We agree that the illustration presented in Figure 11 does not effectively communicate the information as intended and thus has been deleted from the final EIS.

Comment: Why was the capability to monitor the effects of the proposed programs not considered as a factor in devising and evaluating the alternatives? (Arkansas Department of Pollution Control and Ecology; Public Health Service, Department of Health, Education, and Welfare; Oregon Department of Fish and Wildlife)

Response: A comprehensive USDA/EPA monitoring and evaluation program is established in the proposed RCWP rules and regulations. This program will be used to evaluate the overall cost and effectiveness of projects and measures incorporating BMP's to provide information on the effects of the program on improved water quality and for general RCWP management. This monitoring program would be the same for all alternatives evaluated.

Comment: The draft does not explain the rationale for choosing the particular alternative. (Public Health Service, Department of Health, Education, and Welfare; League of Women Voters of North Carolina)

Response: Alternatives addressed in the EIS were developed according to priority criteria. These criteria were based on severity and type of water quality problems as identified on a national basis. Alternatives I and II were developed to define the environmental impact spectrum for comparative purposes. Alternatives III, IV, and V were developed to analyze the environmental effects using different program implementation strategies at reasonable levels of funding. The interdisciplinary team considered these alternatives most appropriate, within constraints of law, for a national program EIS. The preferred alternative was selected because of the greater potential for successfully improving water quality in selected project areas. In addition, other policy alternatives were addressed in the draft regulatory impact analysis. This analysis was developed in accordance with Executive Order 12044.

Comment: The final EIS should select a preferred alternative. (Public Health Service, Department of Health, Education, and Welfare)

Response: The final EIS considers Alternative V, as developed in the draft EIS, as the preferred alternative.

Comment: We question whether implementation of Alternative V can result in control of 30 percent of the total problem when average annual soil loss rates are projected to increase above existing rates. (Iowa Department of Environmental Quality)

Response: The environmental consequences of implementating the various alternatives are derived from a comparison with conditions that would exist in the future without a program (Alternative I), not from existing conditions. The average annual erosion rate under Alternative V is less than under the "no program" alternative. This reduction in average annual erosion rate in conjunction with better management of pesticides, plant nutrients, irrigation water, and feeding operations is estimated to address about 25 tp 80 percent of the total NPS pollution that originates on private rural lands.

Comment: If Alternative II would treat most NPS problems, why would only 45 percent of the problem be treated? (Iowa Department of Environmental Quality)

Response: Problems attributed to geological, mining, urban, and other NPS's are outside the scope of RCWP. Agricultural activities included in RCWP, for example, only contribute about 60 percent of the sediment delivered to streams and lakes. RCWP applies only to rural private agricultural lands, which represent only a portion of NPS problems. Consequently, it is estimated that only 45 percent of the total NPS water pollution problem would be improved under Alternative II to meet national water quality goals.

FISH AND WILDLIFE

Comment: The draft EIS lacks sufficiently detailed information on which to judge the environmental impact on fishery resources. (National Marine Fisheries Service; Alabama Public Health Service; Oregon Department of Fish and Wildlife)

Response: Detailed monitoring and evaluations of the potential effects of RCWP on fishery and wildlife resources, including wetlands, can only practically be done for specific sites, recognizing individual species of wildlife, specific land and water conditions, and specific mixes of BMP's. The monitoring and evaluations are to be done as needed to define fishery and wildlife effects in individual RCWP project areas.

Comment: Additional discussion on protection of wetlands in project areas should be included. (Public Health Service, Department of Health, Education, and Welfare)

Response: We agree. A paragraph has been added to appropriate sections of the final EIS on the need for assessment of fish, wildlife, and wetland effects and the need to preserve and protect wetlands in accordance with the President's Executive Order 11990 on wetlands.

SILVICULTURE

Comment: Further consideration should be given to the role of silviculture in the RCWP. (Public Health Service, Department of Health, Education, and Welfare; Alaska Department of Environmental Conservation; Alaska Department of Forestry; American Forestry Association; Oregon Forestry Department; New Mexico Natural Resources Department; California Department of Forestry)

Response: We agree. Appropriate sections of the final EIS have been expanded to more adequately address the role of silviculture in RCWP.

GENERAL

Comment: The authors might consider providing a brief appendix describing the various management practices, their costs, and relative environmental effects. (Public Health Service, Department of Health, Education, and Welfare; New Mexico Natural Resources Department)

Response: Costs and relative environmental effects will be addressed for each specific project area. From a national perspective, Tables 6 through 10 of the final EIS describe some principal types of best management practices and a description of possible environmental effects of their use. Appendix B includes data relative to costs of controlling agricultural nonpoint source pollution.

Comment: Several activities in agricultural operations have not been adequately evaluated and/or included in the evaluation, such as hydrologic modifications, roads, agriculture-related construction, and silviculture. (Alabama Water Improvement Commission)

Response: For purposes of the RCWP and compliance with Congressional intent, RCWP will address only NPS's that are (a) agriculture-related including runoff from manure disposal areas and from land used for livestock and crop production or (b) silviculture related. The final EIS has been expanded, as appropriate, to more adequately reflect silvicultural activities.

Comment: Sediment yield from geological erosion is estimated to be 30 percent of total yield, but it is not addressed under sediment sources in the text. (Alabama Water Improvement Commission)

Response: The RCWP is designed to cost-share on rural private agricultural lands to reduce man-induced nonpoint source pollutants. Small geological sediment sources may be considered for cost sharing (1) if the problem is high priority and (2) if it is technically feasible to adequately reduce the sediment source to meet water quality goals.

Comment: The average annual soil loss per acre is projected to increase from the present to the year 2000. In reviewing the report, we do not find adequate explanation for this projected increase in soil loss and believe that justification should be provided. (Iowa Department of Environmental Quality)

Response: The projected average annual soil loss per acre, was based on CARD Report 49T, Iowa State University. The future soil loss used to evaluate the various alternatives including the "future without" program (Alternative I) is based on more current data provided by Iowa State University and the Soil Conservation Service. The data from Iowa State University was provided with other impact data and analysis contracted for through Iowa State University.

Comment: The national estimate of $8 to $15 billion expenditure for Alternative II appears low. (Iowa Department of Environmental Quality)

Response: The estimate of $8 to $15 billion expenditure was determined by the average cost of BMP measures as reported in various accepted reports or studies on each of the pollutant problems. The cost of applying each BMP was then applied to the areas that significantly contribute to water quality problems in streams. For example, the treatment of streams with significant sediment problems would not require the treatment of all erosion problems in the country or in the contributing watershed area. The cost estimate is determined using the least costly means of treating significant problem areas to meet the stated objective of water quality.

Comment: The scope of analysis should be expanded to include additional funding levels. (Iowa Department of Environmental Quality)

Response: The EIS team agrees that it would be desirable to analyze various funding levels. The team considered doing so, but did not because such an analysis would be costly to develop and the information it would provide would be of little value to anyone other than those who would determine funding levels.

Comment: We believe the major conclusions are important and therefore should be discussed in more detail. (National Marine Fisheries Service, U.S. Department of Commerce)

Response: For ease of comprehension, we chose not to list in detail the kinds of beneficial impacts and benefits here in the major conclusions. Those effects are, however, discussed in considerable detail in the Environmental Consequences section. As suggested, we have added examples to explain more clearly the kinds of structural measures referred to in the Major conclusions portion of the Summary.

Comment: The criteria described in the draft EIS for selections of RCWP project areas are unclear. (Environmental Defense Fund; Alabama Water Improvement Commission; North Carolina League of Women Voters)

Response: The discussion of priorities for selection of RCWP projects was expanded by replacing the present discussion with the detailed discussion contained in the proposed RCWP rules and regulations. We do not believe it would be appropriate in a national program EIS to provide a detailed analysis of which specific agricultural lands and BMP's should receive assistance. This level of detail will be carefully assessed when each RCWP project application is reviewed. The criteria are designed to provide a rational and recognizable means of selecting RCWP projects without precluding the high degree of initiative and flexibility required at the local level for program success.

Comment: What is the relationship of RCWP to other USDA programs that might affect the successful implementation of RCWP? (Environmental Defense Fund; Public Health Service, Department of Health, Education, and Welfare)

Response: It is recognized that the future success of RCWP will depend upon relationships to other programs within USDA as well as programs of other Federal agencies and those at State and local levels. From a Federal perspective, we believe that Congress, in developing and studying RCWP legislation, analyzed these issues and so constituted RCWP to be compatible with other USDA programs. The primary differences between RCWP and other USDA programs will be the focus on improving water quality and the use of a systematic approach to solving priority rural water quality problems and increasing economic incentives. Also, we recognize that because of differing State and local programs, RCWP is designed to be flexible within discretionary limits provided by law. Within USDA, a strong effort has been, and will continue to be, made through open and joint development of rules and regulations to make RCWP compatible and complementary to existing programs administered by ASCS, FS, FmHA, SCS, and other agencies of the Department.

Comment: What is the relative effectiveness of different BMP's? (Environmental Defense Fund)

Response: We agree that it would be desirable to be able to list BMP's in the order of their relative effectiveness. It is not practical to attempt to do this in a national program EIS because actual BMP effectiveness will be considerably influenced by site conditions in an RCWP project area. The adequacy of the mix of BMP's prescribed by the agricultural section of the 208 plan will be carefully weighed before it is implemented. As needed, additional assessment will be made to adapt BMP's to local conditions to insure maximum effectiveness. Also, we are not completely sure of the relative effectiveness of different BMP's under some resource conditions. The monitoring and evaluation program conducted as part of RCWP will provide the kind of information that will eventually allow us to evaluate the effectiveness of BMP's for many situations.

Comment: We recommend that, as the program is implemented and the National Rural Clean Water Committee is established, a specific nutrient/pesticide task group be appointed to advise the Committee

on appropriate actions regarding nutrients and pesticides. (U.S. Environmental Protection Agency)

Response: This need has been recognized as evidenced by the action of USDA's Environmental Quality Committee on August 8, 1978, in reorienting its environmental work groups. The USDA work groups established will have the required expertise to assist the National Rural Clean Water Committee on appropriate actions regarding nutrients and pesticides.

Comment: As the program is evaluated, it may be advisable to include a comparative analysis of areas where good water quality is being maintained and similar areas where water pollution problems are being addressed through the RCWP. (U.S. Environmental Protection Agency)

Response: We appreciate receiving the suggestion on the use of control watersheds without an RCWP project as a check on program effectiveness. Within the proposed RCWP rules and regulations, there are requirements that USDA/EPA jointly select areas to be monitored, and this suggestion can be addressed at that time.

Comment: A discussion should be included concerning the effects on the agricultural community, the socioeconomic effects, and the effects on the Nation's ability to produce needed food and fiber. (New Mexico Natural Resources Department; Iowa Department of Environmental Quality; Harold Felt, Colorado; Ralph Selle, Indiana; U.S. Environmental Protection Agency)

Response: In some cases, the BMP's designed for sediment, nutrient, pesticide, or salinity reduction will be an excessive financial burden to cooperating farmers. At a 50 percent cost-sharing rate, the cost to individual farmers may be so great that they will not participate in the program. This may be especially true in those areas considered in the EIS under Alternative IV where expensive structural measures such as terraces or salinity control structures are needed or where cropping systems must be changed from row crops to grass.

Most of the areas identified in the EIS under Alternative III require less costly installation of BMP's. Management measures such as reduced or minimum tillage or irrigation water management often reduce farm production costs and improve net income. Less expensive stripcropping or contour farming and some terraces may or may not have a slight effect on net farm income depending on the productivity of the soil, depth of topsoil, cropping pattern, and current erosion rates. One of the criteria that will be considered for project selection is economic feasibility.

In the long run, most measures applied for sediment control will also help preserve the productivity of an otherwise deteriorating soil resource. Actual effects on specific farms will depend on the depth of topsoil, erosion rates with and without the measures, and cropping patterns. For example, in one river basin, future soybean yields on

Class III lands have been projected to average 24 bushels with continuous straight row farming as compared to a projected yield at some future time period of 27 bushels with recognized BMP's of stripcropping and minimum tillage that will reduce average annual soil loss 35 percent. Additional measures such as terraces would further reduce the soil loss and thus protect the productivity of the land resource.

A report by Boggess, McGrawn, Heady, and Boehlje, A Farm Level Financial Analysis of Alternative Soil Loss Control Policies, Iowa State University, Ames, Iowa, discusses the findings of a study conducted by the authors. The report discusses "a farm level model which is used to analyze the impacts of alternative soil loss control policies. Adjustments in farm management practices required by alternative control policies are discussed. In addition, the analysis investigates the impacts of soil loss controls on farm financial characteristics including income generation, cash flows, asset values, and dept servicing capability."

BMP's designed for pesticide and nutrient control are generally management practices. As such, their effect on farm income would be a reduced production cost resulting from the use of less pesticides. Measures are designed to assist the farmer in attaining optimum use of pesticides and nutrients. Proper application methods and optimum application rates will be emphasized.

BMP's designed for animal waste control may be costly to the farmer depending on his proximity to the stream, the density of his livestock herd, the climate of the region, and the type of livestock enterprise involved. Other management-oriented BMP's may cost very little and consequently have no effect on net farm income.

Comment: There are some serious misrepresentations in the draft EIS relative to the quantities of pesticides and nutrients that are used improperly on croplands. (Ohio State University; Ohio Department of Agriculture; The Fertilizer Institute)

Response: We agree, and appropriate editorial changes have been made to recognize the current management level and efforts of many farmers to balance use of fertilizer and pesticides as closely as possible with actual needs.

Comment: Recent surveys by the Association of American Plant Food Control Officials show that nonfarm use is only about 3 percent of total fertilizer use. This conflicts with the 25 percent indicated in the draft EIS. (The Fertilizer Institute)

Response: We concur that only about 3 percent of total fertilizer use is for nonfarm application. Appropriate changes have been made in the final EIS to reflect this change.

Comment: Soil testing and plant analysis should be included in the list of practices identified in table 7 for reducing nutrient loss. (The Fertilizer Institute)

Response: Soil testing and plant observation are considered common practices and their use is implied in the practices for the control of nutrient loss from agricultural application.

Comment: The EIS indicates that most feedlots are classified as point sources by the Environmental Protection Agency and consequently would not be eligible for RCWP cost sharing. The role of feedlots in the RCWP should be examined in more detail and clarified. (Public Health Service, Department of Health, Education, and Welfare; Iowa Department of Environmental Quality)

Response: The RCWP is designed to provide financial assistance for implementing plans prepared under section 208(j) of P.L. 92-500 to control agricultural nonpoint sources of pollution on private rural lands. Most livestock operations will have both point and nonpoint source problems.

Any livestock operation would be eligible for RCWP cost-sharing funds to reduce nonpoint sources provided that the operation had been determined to be a high priority project area and if adequate participation of land owners or operators was insured.

Comment The effectiveness of a voluntary program in controlling NPS pollution is questioned. (North Carolina League of Women Voters)

Response: RCWP is designed to cost share on eligible BMP's within appropriate RCWP projects on a voluntary basis. This is exemplified in Senate Report No. 95-370, 95th Congress, 1st Session, which states that, "A system of technical and financial assistance for instituting soil conservation practices for improving water quality will encourage individuals to control nonpoint source pollution voluntarily." In addition, voluntary participation was strongly endorsed at all ten nationwide RCWP public meetings. One aspect of the monitoring and evaluation program established in the proposed RCWP rules and regulations will be to measure the success of a voluntary program.

Comment: Because the RCWP is to be federally funded, we suggest the state A-95 clearing house agencies receive copies to be distributed for review and comment. (Alabama Water Improvement Commission)

Response: Notice of availability of the draft EIS was published in the Federal Register on June 26, 1978, and copies were distributed as requested. The EPA mailing list of state and substate 208 planning agencies was used for initial distribution of the draft EIS. Most A-95 clearinghouses were included on this list. Individual project applications will be submitted in conformance with the OMB Circular A-95 review process.

Comment: The draft EIS speaks of owners or operators entering into 5- or 10-year contracts for certain land management practices. What are plans for subsequent years? (Public Health Service, Department of Health, Education, and Welfare)

Response: The EIS assumes that BMP's will remain functional throughout an expected average life of about 15 years. However, if water quality in rural areas is to be maintained and improved beyond the expected life of a particular BMP, the BMP must be replaced or rehabilitated.

Comment: A detailed explanation of "administrative flexibility" is needed to justify the preference for Alternative V. (Alabama Water Improvement Commission)

Response: Administrative flexibility will allow the administering agency to exercise prudent discretion in implementing the RCWP in those priority areas where local interests have expressed their willingness to cooperate.

Comment: It is our understanding that 25 percent of the 1975 Long-Term Agreements (LTA) approved in California have been terminated before completion. Careful consideration should be given before applying the same program guidelines for RCWP as were used for the 1975 LTA program. (California Department of Forestry)

Response: In developing RCWP, we are drawing on experience gained from analyses of other USDA cost-sharing programs. Program guidelines have been carefully considered for their feasibility and practicality to insure maximum potential for success.

Comment: The final statement should include a comprehensive description of the alternatives and describe how each proposal would be implemented. (Oregon Department of Fish and Wildlife)

Response: The alternatives section of the final EIS has been modified to more clearly delineate the alternatives. Implementation of RCWP is described under the Program Administration section of the final EIS.

Comment: The discussion of the effects on the agricultural community infrastructure should be expanded. (U.S. Environmental Protection Agency; Environmental Defense Fund)

Response: It is recognized that the strength of the RCWP depends on a unified approach to program implementation. USDA participation will be channeled through existing local governmental organizations with which USDA agencies have established working agreements. Any increased workload on these agriculture-related local units of government would divert their resources from other activities unless the units are staffed to meet the increased work demands. The participation will also cause these local units to broaden their influence over activities affecting water quality.

The U.S. Department of Agriculture has the technical capability and institutional arrangements to work with land users, operators, and others whose activities in rural areas affect water quality. Through its field force in education, research, technical, financial, and loan assistance programs, and its cooperative arrangements with individuals and with local conservation districts, State forestry agencies, State

soil and water conservation agencies, cooperatives, and similar groups, the Department has an effective technology transfer and delivery system which can be utilized to assist in achieving water quality goals in a coordinated manner.

This delivery system is recognized in the proposed RCWP rules and regulations where there is a process for establishment of rural clean water coordinating committees at the State and local levels.

To fully evaluate and demonstrate the potential effectiveness of this delivery system, the Environmental Protection Agency and USDA initiated, in September of 1977, a Model Implementation Program (MIP). Primary objectives of MIP are:

1. Through implementation, demonstrate and evaluate the effectiveness of the MIP for water quality management.

2. Develop and/or improve lines of communications between and among the various identified programs in USDA and with EPA.

3. Pursue reorientation of priorities to allow for coordinated action among the various programs.

Positive effects of MIP to date indicate the established USDA delivery system can work.

Comment: Nonstructural stream treatments should be used wherever possible before considering only instream stream structures. (Oregon Department of Fish and Wildlife)

Response: The use of instream BMP's for water quality improvement under the RCWP is anticipated to be limited. Such measures will be utilized only when they have been identified and approved in a 208 plan as the BMP necessary to improve water quality in a specific area.

Comment: The statement that 200-250 million acres require treatment for pesticide and nutrient control is not true. (Ohio Department of Agriculture)

Response: We agree. Appropriate changes have been made to more adequately reflect estimated acreages requiring nutrient and pesticide management.

APPENDIX A

Environmental Impact Analysis Worksheet

Table AI -- Surface water quality impact analyses

WATER	PRESENT CONDITIONS	PREDICTED FUTURE CONDITIONS FOR SELECTED PROGRAM ALTERNATIVES				
		ALTERNATIVE I 1/	ALTERNATIVE II 2/	ALTERNATIVE III 3/	ALTERNATIVE IV 4/	ALTERNATIVE V 5/
1. Bacteria						
Subjective rating 5/	60% of stream basins adversely impacted by nonpoint sources	+2	+6	>Alt I, > Alt IV > Alt V, < Alt II	> Alt I, < Alt III, < Alt V	> Alt I, > Alt IV, & ≤ Alt III
Logic used in rating		NPDES permits and State regulations would control some animal confinement systems.	All animal waste properly managed. natural bacterial levels would remain. would remain.	More animal waste properly managed than Alt's I, IV, and V. However, less than Alt II due to fund limitation.	More animal waste properly managed than Alt I but less than III and V because fewer animal units will be impacted by the program.	More animal waste properly managed than Alt I and IV but less than Alt III because fewer animal units will be impacted. However, with strong local desire for program implementation, the effectiveness of the installed practices will be greater than all the other Alternatives due to better management of the Practices and more effective implementation
		----------Large animal confinement systems not considered in the program because they				are classified as point sources----------
2. Oxygen depletion material						
Subjectiving Rating	50% of stream basins adversely impacted by nonpoint sources.	+2	+8	+4	+2 but > Alt I	< +4
Logic used in rating		----------Higher technical potential to control oxygen depletion material from livestock than ----- bacteria; therefore, a slight increase in ratings over bacteria is justified. The remaining logic is the same as the logic applied to bacteria.				
3. Nutrients						
Subjective Rating	57% of stream basins adversely impacted by	-2 for absorbed 0 for soluble	+8 for absorbed +4 for soluble	+4 for absorbed +2 for soluble	+2 for absorbed +1 for soluble	+4 for absorbed +2 for soluble
Logic used in rating		Increased erosion would increase absorbed nutrients. Reduction of small animal waste nutrients sources would reduce soluble nutrients; however, current level of fertilizer management would continue, potentially neutralizing benefits.	Adequate reduction of sediment thereby reducing absorbed nutrients. Man influenced soluble nutrients can be controlled by management systems for fertilizer and animal waste. Because of natural soluble nutrient loadings, it is difficult to determine if control of man induced nutrients will be adequate for improving water quality in some areas.	The reduction in the absorbed nutrients for sediment control. Reduction in soluble nutrients, fertilizer, and animal waste from natural background nutrient.	Will closely correlate Will correlate with lands however, uncertainty rating.	with the amount of land properly treated that have adequate management; of impacts levels, lowers the positive

See footnotes at end of table.

Table AI - Continued

WATER	PRESENT CONDITIONS	PREDICTED FUTURE CONDITIONS FOR SELECTED PROGRAM ALTERNATIVES				
		ALTERNATIVE I 1/	ALTERNATIVE II 2/	ALTERNATIVE III 3/	ALTERNATIVE IV 4/	ALTERNATIVE V 5/
4. .Suspended Solids						
Subjective rating	55% of stream basins adversely impacted by nonpoint sources	-2	+8	+2	0	+2
Logic used in rating		The projected soil erosion will increase over present conditions allowing more soil to enter the Nation's water.	Average cropland soil loss will be 2 tons/ac and suspended solids loading to the streams would be significantly reduced.	This alternative would be treating more land areas that require vegetative and crop management sediment control practices; thus, significantly more suspended solids would be controlled on the land.	Although the quantity of sediment controlled would be significant, much of the controlled sediment would influence the stream bedload rather than suspended solids.	Although the total quantity of sediment removed from the Nation's water will be slightly less than Alt III, the BMP's will be more uniformly accepted in the project areas. This acceptance will encourage broad application of BMP's and retain more soil on the land.
5. Dissolved Solids						
Subjective impact rating	29% of stream basins adversely impacted by nonpoint sources.	0	+8	+2	0 but > Alt I	+2
Logic used in rating		Ongoing programs should stabilize salinity impacts to water quality.	Adequate funding to properly install needed practices and regulate water management.	Significantly more acres treated than Alt IV and the streams should not be grossly overloaded under present conditions and have a good opportunity for success.	Because of the small number of acres treated, the impact is not sufficient to warrant a full unit rating.	More uniform acceptance within the project area will insure better salinity control and effects on water quality will be equal to Alt III.
6. Sediment (delivered to streams) from cropland only		108 million tons	42 million tons	70 million tons	76 million tons	72 million tons unknown
	Other sediment sources = 900 million tons	Unknown	Unknown	Unknown	Unknown	Unknown
Logic used in rating		Projected from National Water Assessment data----------				
7. Pesticide						
Subjective rating	21% of the stream basins adversely impacted by nonpoint sources	-2 for adsorbed +2 for soluble	+8 for adsorbed soluble unknown (?Alt I)	+4 for adsorbed soluble unknown (?Alt I)	+2 for adsorbed Soluble unknown (?Alt I)	+4 for adsorbed Soluble unknown (Alt I)
Logic used in rating		Ongoing programs would regulate types and use of pesticides. Erosion would increase and transport more absorbed.	----------Adsorbed pesticide transport to the stream from the field is correlated with the amount of sediment delivered and rated accordingly. For soluble pesticides, integrated pest management will be emphasized but national beneficial impact on water quality is indeterminate with present quantitative information.			

1/ No expenditure of funds under this program or future without the program.

2/ Sufficient expenditures to adequately treat most NPS pollution on private rural lands.

3/ Expenditure level at about 20 percent of Alternative II but directed towards improving water quality in as many lakes and miles of stream as possible.

4/ Expenditure level at about 20 percent of Alternative II but directed towards improving water improving water quality in lakes and streams with high NPS loads.

5/ Expenditure level at about 20 percent of Alternative II but allows for a broad eligibility of project areas and administrative flexibility to select projects with the highest potential of success.

6/ Based on ratings of -10 for most adverse environmental effect to +10 for most beneficial environmental effect.

Table A-2 Land Quality Impact Analysis

LAND	PRESENT CONDITIONS (1974)	PREDICTED FUTURE CONDITIONS FOR SELECTED PROGRAM ALTERNATIVES				
		ALTERNATIVE I 1/	ALTERNATIVE II 2/	ALTERNATIVE III 3/	ALTERNATIVE IV 4/	ALTERNATIVE V 5/
I. Land area Million Acres	2,264	2,264	2,264	2,264	2,264	2,264
A. Cropland Million Acres	362.8	362.8	362.8	362.8	362.8	362.8
1. Irrigated Million Acres	44	44	44	44	44	44
2. Dryland Million Acres	318.8	318.8	318.8	318.8	318.8	318.8
B. Pasture & rangeland Million Acres	886.2	886.2	886.2	886.2	886.2	886.3
C. Woodland & forest - Million Acres	718	718	718	718	718	718
D. Urban & other - Million Acres	297	297	297	297	297	297
II. Sheet - Rill Erosion - Soil Loss						
A. Cropland - ton/acre/yr	9	9.9	6.5	9	9.6	9.2
B. Cropland - million tons	--	3,592	2,358	3,266	3,483	3,338
C. Forest - Range Average annual/ton/ac/yr	1	1	1	1	1	1
III. Cropland Needing Treatment- Million Acres for sheet and rill erosion	177	178	114	163	167.5	164.4

1/ No expenditure of funds under this program or in the future without the program.

2/ Sufficient expenditures to adequately treat most NPS pollution sources on private rural lands. (More than 64 million acres of NPS source areas would be treated.

3/ Expenditure level at about 20 percent of Alternative II but directed toward improving water quality in as many lakes and miles of stream as possible. (More than 15 million acres of NPS source areas would be treated.)

4/ Expenditure level at about 20 percent of Alternative II but directed toward concentrating treatment in areas contributing the greatest volumes of NPS pollutants. (More than 10 million acres of NPS source areas would be treated.)

5/ Expenditure level at about 20 percent of Alternative II but directed toward concentrating treatment in areas considered in Alternative III and IV that have highest potential for success.

Table A-3 Evaluation for Fish and Wildlife Habitat

Effect Component	Alt 1		Alt 2		Alt 3		Alt 4		Alt 5	
	F	W	F	W	F	W	F	W	F	W
Land Use & Mgt	+		++++		+		++			++
Soil Loss	-	-	++++	+	++	+	+	+	++	+
Surface Water	(-)		(++++)							
Bacteria	+		++++		+++		+++		+++	
Oxygen	+		++++		+++		++		+++	
Nutrients	+-		++++		++		+		++	
Suspended Solids	-		+++		+		+-		++	
Dissolved Solids	+-		++++		++		+		+++	
Sediment	-		++++		+		+-		+	
Pesticides	+-	-	+++	++	++	+	+	+	+	+
Total	+-	-	++++	+++	++	+	+	++	+++	++

\+ Minor positive effect on habitat.
++ Moderate positive effect on habitat.
+++ Significant positive effect of habitat.
++++ Very significant positive effect on habitat.
\- Minor negative effect on habitat.

Table A-4 Evaluation of acres treated for sediment control

Alternative II

(Acres treated per 1000 acres of cropland used)

	Straight Row			Contour Farming			Stripcropping			Terraces		
1/	CON RR	CON RL	MIN TIL	CON RR	CON RL	MIN TIL	CON RR	CON RL	MIN TIL	CON RR	CON RL	MIN TIL
Base	109	335	57	103	81	191	23	10	43	-	9	-
Alternative II	37	80	157	62	123	319	18	25	83	9	19	40
Alternative III												
Base	131	432	83	60	13	160	1	-	19	-	-	-
Alternative III	78	142	69	65	211	216	6	38	41	-	2	-
Alternative IV												
Base	62	290	36	343	90	114	31	24	2	-	-	-
Alternative IV	-	17	271	119	6	438	7	30	33	38	2	22
Alternative V												
Base	110	400	69	145	36	154	10	7	14	-	-	-
Alternative V	55	105	130	81	149	195	6	35	39	11	2	7

1/ CON - RR Conventional tillage residue removed
CON - RL Conventional tillage residue left
MIN - TIL Minimum tillage

APPENDIX B

Support Material for Alternative Selection

Table B-1 Water quality conditions in major subregions of the U.S. (Source: U.S. Water Resources Council, 1977 Second National Water Assessment)

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	Water Surface Area Needs 1,000 Acres 2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
Northern Maine	0101	NF	0.0	0.0	0%	13380	5	5.9
Saco-Merrimack	0102	NF	0.0	23.0	N/C	4350	10	7.2
Mass-Rhode 1-Coastal	0103	NF	442.0	684.0	55%	2920	30	8.5
Housatonic-Thames	0104	NF	46.0	82.0	70%	2782	30	6.8
Connecticut River	0105	NF	72.0	140.0	94%	4277	20	5.5
Richlieu	0106	NF	0.0	0.0	0%	2025	5	7.3
Upper Judson	0201	NF	0.0	0.0	0%	776	10	11.8
Low Hudson-LI-NNJ	0202	NF	1187.0	1716.0	45%	792	50	7.0
Delaware	0203	NF	246.0	499.0	103%	1085	60	15.5
Susquehanna	0204	NF	80.0	127.0	59%	4266	10	10.0
Up/Low Chesapeake	0205	NF	0.0	0.0	0%	6099	30	15.0
Potomac	0206	NF	166.0	360.0	117%	3400	10	19.9
Roanoke-Cape Fear	0301	NF	147.0	245.0	67%	9019	40	19.8
Pee Dee-Edisto	0302	NF	0.0	136.0	N/C	9130	30	17.2
Savannah-St Marys	0303	NF	0.0	0.0	0%	1654	5	14.9

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	Water Surface Area Needs 1,000 Acres 2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
St. Johns-Suwannee	0304	NF	282.0	490.0	74%	1197	40	13.4
Southern Florida	0305	NF	0.0	0.0	0%	1690	50	6.4
Apachicola	0306	NF	146.0	295.0	102%	1040	30	16.1
Ala-Choctawhatchee	0307	NF	152.0	202.0	33%	2140	20	22.0
Hobil-Tohbigbee	0308	NF	132.0	171.0	30%	839	20	20.1
Pascagoula-Pearl	0309	NF	99.0	126.0	27%	813	30	35.0
Lake Superior	0401	NF	0.0	0.0	0%	1609	5	5.0
NW Lake Michigan	0402	NF	0.0	0.0	0%	2159	5	4.2
SW Lake Michigan	0403	NF	606.0	962.0	40%	78	50	5.1
E Lake Michigan	0404	NF	0.0	0.0	0%	2702	5	6.2
Lake Huron	0405	NF	0.0	0.0	0%	1294	5	3.3
St Clair-W Lake Erie	0406	NF	334.0	552.0	65%	1682	30	3.7
Eastern Lake Erie	0407	NF	264.0	374.0	42%	1269	40	7.5
Lake Ontario	0408	NF	0.0	0.0	0%	1356	40	7.7
Ohio Headwaters	0501	NF	48.0	57.0	19%	3943	10	7.0
Upper Ohio-Big Sandy	0502	NF	279.0	350.0	25%	2739	40	10.0

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	Water Surface Area Needs 1,000 Acres 2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
Muskingum-Scioto-Mi	0503	NF	310.0	439.0	42%	3662	30	6.8
Kanawha	0504	NF	32.0	39.0	22%	2378	20	11.0
Ky-Licking-Or-Ohio	0505	NF	10.0	85.0	750%	7774	70	11.0
Wabash	0506	NF	276.0	391.0	42%	5447	40	7.7
Cumberland	0507	NF	6.0	43.0	617%	3049	20	12.0
Upper Tennessee	0601	NF	0.0	45.0	N/C	1185	10	10.0
Lower Tennessee	0602	NF	0.0	0.0	0%	1152	5	25.0
Mississippi Hdwaters	0701	NF	0.0	67.0	N/C	1558	5	8.0
Ak-Root-Chippewa-Wis	0702	NF	0.0	0.0	0%	1702	5	8.3
Rock-Miss-Des Moines	0703	NF	231.0	320.0	39%	2765	30	8.7
Salt-SHY-Illinois	0704	NF	74.0	130.0	76%	1784	70	10.3
Low/Up Mississippi	0705	NF	204.0	266.0	30%	1561	50	17.9
Hatchie-Miss-St Fran	0501	NF	100.0	153.0	53%	2480	70	28.6
Yazoo-Miss-Quachita	0802	NF	0.0	10.0	N/C	8242	60	19.3
Mississippi Delta	0803	NF	82.0	129.0	57%	3410	10	12.0
Souris-Red-Rainy	0901	NF	0.0	0.0	0%	850	5	2.3

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
Mo-Milk-Saskatchewan	1001	NF	0.0	0.0	0%	1167	5	1.5
Missouri-Marias	1002	NF	0.0	0.0	0%	0	5	1.3
Missouri-Musselshell	1003	NF	0.0	0.0	0%	0	5	1.7
Yellowstone	1004	NF	0.0	0.0	0%	0	5	2.0
Western Dakotas	1005	NF	0.0	0.0	0%	1753	5	2.7
Eastern Dakotas	1006	NF	0.0	0.0	0%	1057	10	5.4
No/So Platte	1007	NF	0.0	3.0	N/C	994	10	5.9
Niobrara-Platte-Loup	1008	NF	0.0	0.0	0%	762	5	9.4
Middle Missouri	1009	NF	6.0	19.0	217%	1221	5	15.7
Kansas	1010	NF	0.0	0.0	0%	805	5	5.7
Lower Missouri	1011	NF	0.0	0.0	0%	640	5	19.3
Upper White	1101	NF	0.0	0.0	0%	6125	50	21.2
Upper Arkansas	1102	NF	39.0	53.0	36%	2610	5	5.9
Arkansas-Cimarron	1103	NF	91.0	99.0	9%	5475	30	4.4
Lower Arkansas	1104	NF	17.0	70.0	312%	6670	70	9.3
Canadian	1105	NF	57.0	96.0	68%	4240	86	4.5

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
Red-Washita	1106	NF	0.0	0.0	0%	4460	70	5.6
Red-Sulphur	1107	NF	46.0	64.0	39%	5317	60	11.7
Sabine-Neches	1201	NF	27.0	56.0	107%	2480	5	15.1
Trinity-Galveston By	1202	NF	391.0	657.0	68%	2650	10	12.3
Brazos	1203	NF	11.0	24.0	110%	2290	10	6.3
Colorado (Texas)	1204	NF	9.0	29.0	222%	2948	5	5.6
Nueces-Texas Coastal	1205	NF	101.0	135.0	34%	2020	20	7.3
Rio Grande Hdwaters	1301	NF	0.0	0.0	0%	3215	5	0.8
Middle Rio Grande	1302	NF	82.0	113.0	38%	0	10	0.9
Rio Grande-Pecos	1303	NF	7.0	6.0	-14%	615	10	0.4
Upper Pecos	1304	NF	0.0	0.0	0%	0	5	0.3
Lower Rio Grande	1305	NF	40.0	41.0	2%	520	20	3.9
Green-White-Yampa	1401	NF	0.0	0.0	0%	2330	5	3.1
Colorado-Gunnison	1402	NF	0.0	0.0	0%	1756	5	1.7
Colorado-San Juan	1403	NF	0.0	0.0	0%	2982	5	1.0
Little Colorado	1501	NF	5.0	7.0	40%	500	5	1.5

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
Lower Colo Main Stem	1502	NF	0.0	0.0	0%	1590	5	1.5
Gila	1503	NF	89.0	178.0	100%	785	5	1.9
Bear-Great Salt Lake	1601	NF	0.0	0.0	0%	2690	60	2.7
Sevier Lake	1602	NF	0.0	0.0	0%	1290	5	1.3
Humuoldt-Tonopah Des	1603	NF	1.0	5.0	400%	1100	5	2.4
Central Lahontan	1604	NF	0.0	0.0	0%	515	5	2.7
Clark Fork-Kootenai	1701	NF	0.0	0.0	0%	4891	10	3.4
Upper/Mid Columbia	1702	NF	0.0	0.0	0%	3016	40	1.3
Upper/Central Snake	1703	NF	0.0	0.0	0%	3703	20	2.8
Lower Snake	1704	NF	0.0	0.0	0%	1611	20	5.0
Coast-Lower Columbia	1705	NF	81.0	158.0	95%	13401	50	2.6
Puget Sound	1706	NF	17.0	74.0	335%	3850	70	0.6
Oregon Closed Basin	1707	NF	0.0	0.0	0%	60	5	2.7
Klamath-N Coastal	1801	NF	0.0	0.0	0%	5054	5	0.9
Sacramento-Lahontan	1802	NF	0.0	0.0	0%	2548	5	0.4
San Joaquin-Tulare	1803	NF	84.0	117.0	39%	1530	5	0.4

Table B-1 Water quality conditions in major subregions of the U.S.

Aggregated Subregions			Water Surface Area Needs 1,000 Acres 1975	2000	Change in Water Needs Percent 1975-2000	Stream Miles Miles 1975	Percent of Streams Not Meeting Qual. Stds. Percent 1975	Cropland Sheet and Rill Erosion Tons/Ac/Yr
San Francisco Bay	1804	NF	242.0	361.0	49%	1207	10	0.8
Central Calif Coast	1805	NF	82.0	115.0	40%	1441	5	1.2
Southern California	1806	NF	398.0	651.0	64%	760	5	0.8
South Lahontan	1807	NF	0.0	0.0	10%	99	5	0.5
Alaska	1901	NF	0.0	0.0	0%	N/A	N/A	N/A
Hawaii County	2001	NF	0.0	0.0	0%	N/A	N/A	N/A
Haui County	2002	NF	0.0	0.0	0%	N/A	N/A	N/A
Oahu County	2003	NF	0.0	0.0	0%	N/A	N/A	N/A
Kauai County	2004	NF	0.0	0.0	0%	N/A	N/A	N/A
Puerto Rico	2101	NF	5.0	8.0		N/A	N/A	N/A
Virgin Islands	2102	NF	N/A	N/A		N/A	N/A	N/A

Table B-2.--Nonpoint sources of pollution

Region	Percentage of Basins Affected by Type of Nonpoint Source (Number of Basins)							
	Urban Runoff	Construction	Hydrologic Modification	Silviculture	Mining	Agriculture	Solid Waste Disposal	Individual Disposal
Northeast (40)	70	15	18	10	20	55	35	63
Southeast (47)	57	2	21	30	15	62	9	40
Great Lakes (41)	51	7	2	15	41	59	15	39
North Central (35)	51	6	3	6	34	86	9	29
South Central (30)	43	0	23	13	53	83	13	40
Southwest (22)	18	5	18	5	36	73	0	36
Northwest (22)	23	23	27	27	23	55	9	32
Hawaiian Islands & Puerto Rico	67	67	22	0	0	78	22	89
Total (246)	50	10	15	15	30	67	14	43

Source: U.S. Environmental Protection Agency, unpublished draft, National Water Quality Inventory, 1977 Report to Congress.

Table B-3.--Effects of nonpoint sources of pollution

Region (Number of Basins)	Percentage of Basins Affected by Type of Pollution Problem from Nonpoint Sources								
	Bacteria	Oxygen Depletion	Nutrients	Suspended Solids	Dissolved Solids	pH	Oil & Grease	Toxics	Pesticides
Northeast (40)	70	53	63	65	10	18	15	33	18
Southeast (47)	66	74	57	34	4	9	4	15	23
Great Lakes (41)	46	51	44	59	22	29	20	27	17
North Central (35)	69	66	69	80	49	17	0	34	34
South Central (30)	53	43	63	37	70	23	3	47	37
Southwest (22)	36	14	45	32	68	14	14	27	0
Northwest (22)	64	18	55	64	14	9	5	32	0
Hawaiian Islands & Puerto Rico (9)	89	44	44	100	0	0	0	22	44
Total (246)	60	50	57	55	29	17	9	29	21

Source: U.S. Environmental Protection Agency, unpublished draft. National Water Quality Inventory, 1977 Report to Congress.

Table B-4.--Number and length of river channels
in the United States
(Excluding Tributaries of Smaller Order)

Order 1/	Number	Average Length (Miles)	Total Length (Miles)	Mean Drainage Area Including Tributaries	River Representative of Each Size
1	1,570,000	1	1,570,000	1	
2	350,000	2.3	810,000	4.7	
3	80,000	5.3	420,000	23	
4	18,000	12	220,000	109	
5	4,200	28	116,000	518	
6	950	64	61,000	2,460	
7	200	147	30,000	11,700	Allegheny
8	41	338	14,000	55,600	Gila
9	8	777	6,200	264,000	Columbia
10	1	1,800	1,800	1,250,000	Mississippi
Total			3,250,000	(approx.)	

1/ The definition is that of Strahler: Order 1 is channel without tributaries; order 2 is channel with only order 1 tributaries, but includes only the length segment between junction upstream of order 1 channels and junction downstream with another order 2 channel.

Source: Leopold, L. B., Wolman, M. G., Miller, J. P. 1964. Fluvial Processes in Geomorphology, p. 142, W. H. Freeman and Company, San Francisco and London.

Table B-5.--Cost of controlling pollution from dairies

Region	Number of Dairies (000)	Number of Cows (000)	Cost of Upgrading Waste Management Facilities	Annual Cost of Installation Investment 1/	Annual Cost as a Percent of Gross Sales
			----------Million----------		
New England	7.05	393.13	20.44	2.86	0.82
Middle Atlantic	33.65	1,592.24	82.80	11.59	0.85
East North Central	72.84	2,921.38	151.91	21.26	0.97
West North Central	43.71	2,042.53	106.21	14.86	1.13
South Atlantic	9.20	823.77	42.84	5.99	0.79
East South Central	11.42	645.69	33.58	4.70	1.15
West South Central	6.76	566.58	29.46	4.12	0.92
Mountain	5.30	423.63	22.03	3.08	0.91
Pacific	6.13	1,025.24	53.31	7.46	0.72
Total			542.58	75.91	

1/ 10 year life - 6-5/8%

Table B-6.--Susceptibility of cropland to erosion in 1975 by water resource regions (in thousand acres)

Water Resource Region	Slight	Moderate	Severe	Very Severe	Total Acres
1. New England.....	461	529	44	4	1,038
2. Middle Atlantic.....	2,893	4,759	668	226	8,546
3. South Atlantic Gulf..	9,134	9,402	635	325	19,406
4. Great Lakes.....	13,378	7,469	405	125	21,377
5. Ohio.....	15,115	9,225	1,202	367	25,909
6. Tennessee.....	795	1,628	254	127	2,804
7. Upper Mississippi....	27,108	24,250	1,903	618	53,879
8. Lower Mississippi....	14,016	2,843	219	101	17,179
9. Souris-Red Rainy.....	7,600	9,518	237	84	17,439
10. Missouri Basin.....	31,118	41,399	6,322	1,528	80,367
11. Arkansas-White-Red...	16,902	14,733	3,059	456	35,150
12. Texas Gulf.....	9,958	10,302	1,208	232	21,700
13. Rio Grande.....	1,776	368	38	6	2,188
14. Upper Colorado.....	155	464	205	30	854
15. Lower Colorado.....	1,197	56	3	4	1,260
16. Great Basin.....	924	630	102	9	1,665
17. Pacific Northwest....	5,555	7,778	1,484	230	15,047
18. California.....	6,936	1,840	463	109	9,348
National Total.....	165,021	147,193	18,451	4,491	335,156

Source: USDA, "Cropland Erosion by Water."

Table B-7.--Average erosion rates for various regions

Region	Average Tons Per Acre Per Year	Region	Average Tons Per Acre Per Year
New England	7	Missouri	7
Middle Atlantic	14	Arkansas-White-Red	6
South Atlantic Gulf	18	Texas Gulf	7
Great Lakes	5	Rio Grande	2
Ohio	9	Upper Colorado	2
Tennessee	19	Lower Colorado	2
Upper Mississippi	10	Great Basin	2
Lower Mississippi	23	Columbia-North Pacific	2
Souris-Red-Rang	2	California-South Pacific	1

Table B-8
Runoff and Salt Load at Selected Streamgages

River System and Streamgage Locations	Drainage Area	Average Annual Runoff	Average Annual Salt Load (TDS)	
	Sq. Mi.	1,000 AF	1,000 Tons	Tons/Sq. Mi.
Colorado River near Grand Canyon, AZ	137,800	12,300	7,400	54
Colorado River at Cisco, UT	24,100	4,906	4,120	172
Columbia River at Vancouver, WA	241,000	146,250	10,500	85
Rio Grande near Bernardo, NM	16,300	550	400	25
Rio Puerco near Bernardo, NM	6,200	150	75	12
Pecos River near Puerto de Luna, NM	3,970	145	270	68
Pecos River at Red Bluff, NM	19,540	--	890	46
Arkansas River at Caddoa, CO	18,130	310	360	20
Fountain Creek at Pueblo, CO	930	40	130	140
Yellowstone River near Sidney, MT	69,100	9,300	5,990	87
Powder River at Arvada, WY	6,050	200	460	76
Eel River at Scotia, CA	3,110	5,260	910	293
Thomes Creek near Paskenta, CA	190	210	30	149
Middle Fork American River at Auburn, CA	610	975	300	494

SOURCE: USDA, SCS, "Erosion, Sediment, and Related Salt Problem and Treatment Opportunities" p. 11.

Table B-9
Gross Sheet and Rill Erosion (1000 of tons annually)

Area	Base	10%	20%	30%	40%
U.S. Total	2,368.8	2,130.34	1,893.72	1,657.11	1,420.52
New England	4.30	3.91	3.47	3.04	2.65
Middle Atlantic	87.90	79.14	70.35	61.55	52.76
South Atlantic Gulf	283.32	256.87	228.42	199.96	171.51
Great Lakes	85.66	77.10	68.53	59.96	51.40
Ohio	219.90	197.91	175.92	153.93	131.94
Tennessee	28.33	25.50	22.67	19.83	17.00
Upper Mississippi	464.50	418.05	371.60	325.14	278.70
Lower Mississippi	322.94	290.64	258.35	226.05	193.76
Souris-Red-Rany	33.00	27.90	26.40	23.10	19.80
Missouri	504.52	453.72	403.31	352.89	302.48
Arkansas-Red-White	171.76	154.58	137.41	120.23	103.05
Texas Gulf	114.33	101.59	90.30	79.02	67.77
Rio Grande	4.72	4.21	3.74	3.27	2.82
Upper Colorado	1.81	1.62	1.44	1.26	1.08
Lower Colorado	0.39	0.35	0.31	0.27	0.23
Great Basin	4.10	3.69	3.28	2.87	2.46
Columbia-North Pacific	31.77	28.59	25.41	22.31	19.06
California-South Pacific	3.55	3.18	2.82	2.38	2.11

Table B-10
Supply Price Impact of Various Levels of Sediment Reduction by Land Treatment

Area	Percent Change in Supply Price From Base			
	10%	20%	30%	40%
U.S. Total	5.1	7.0	13.3	25.8
New England	0.0	-3.4	6.0	8.3
Middle Atlantic	1.9	2.9	6.1	9.7
South Atlantic Gulf	0.6	0.9	2.1	3.2
Great Lakes	0.8	1.8	5.5	10.7
Ohio	0.8	2.1	6.1	11.5
Tennessee	0.7	0.9	3.1	5.7
Upper Mississippi	0.4	0.4	6.5	10.8
Lower Mississippi	2.0	3.2	6.8	11.7
Souris-Red-Rany	1.3	4.0	8.7	16.9
Missouri	1.8	3.9	7.6	13.5
Arkansas-Red-White	0.4	1.8	7.7	13.0
Texas Gulf	5.7	8.9	15.9	21.1
Rio Grande	66.5	72.5	96.7	138.2
Upper Colorado	8.5	8.0	9.3	16.3
Lower Colorado	13.0	21.9	27.8	63.3
Great Basin	6.7	8.1	14.0	22.7
Columbia-North Pacific	2.9	2.9	3.0	8.3
California-South Pacific	7.2	10.3	14.8	20.3

Table B-11
Total Cost of Treatment Above Base

Area	Unit	10%	20%	30%	40%
		Million			
U.S. Total	Dol.	947.27	2,268.48	3,534.25	5,089.39
Acres treated above base	Acres	19.60	36.16	47.69	62.3
New England	Dol.	2.36	5.30	8.59	12.27
Middle Atlantic	"	56.70	101.25	108.32	232.07
South Atlantic Gulf	"	98.91	203.80	320.25	476.27
Great Lakes	"	73.28	167.82	338.02	552.27
Ohio	"	134.21	405.37	683.57	903.61
Tennessee	"	1.95	6.18	20.32	29.39
Upper Mississippi	"	138.32	368.21	573.30	898.75
Lower Mississippi	"	73.09	161.57	262.21	336.54
Souris-Red-Rany	"	30.32	35.00	42.78	105.69
Missouri	"	184.50	462.83	474.28	1,026.45
Arkansas-Red-White	"	55.50	164.26	258.84	379.75
Texas Gulf	"	12.66	13.55	20.30	25.66
Rio Grande	"	8.68	9.95	12.16	18.34
Upper Colorado	"	0.91	1.68	3.36	7.52
Lower Colorado	"	0.55	1.46	3.04	4.20
Great Basin	"	6.59	11.43	13.80	16.36
Columbia-North Pacific	"	64.54	135.43	148.18	155.77
California-South Pacific	"	2.43	5.0	7.68	16.29

Table B-12
Weighted Average Cost Per Acre for Various
Levels of Erosion Reduction

Region	Installation Costs Per Acre				Installation Cost Per Ton of Soil Loss Reduction Above Base (Millions)			
	10%	20%	30%	40%	10%	20%	30%	40%
U.S. Total	$ 48.33	$ 68.47	$ 74.11	$81.65	$ 0.35	$ 0.56	$ 0.63	$ 0.73
New England	45.43	62.24	65.67	70.48	0.53	0.77	0.86	0.98
Middle Atlantic	48.64	69.38	74.57	83.15	0.57	0.71	0.87	0.89
South Atlantic Gulf	27.31	52.56	57.63	65.49	0.31	0.43	0.48	0.56
Great Lakes	62.34	84.43	89.14	95.34	0.76	1.18	1.16	2.19
Ohio	57.93	83.27	88.35	61.71	0.53	1.11	1.31	1.39
Tennessee	31.91	49.57	62.27	69.54	0.06	0.13	0.30	0.35
Upper Mississippi	55.27	76.98	85.51	95.91	0.26	0.48	0.52	0.65
Lower Mississippi	31.34	45.19	50.87	55.61	0.20	0.30	0.34	0.35
Souris-Red-Rany	38.63	52.37	54.97	61.51	0.81	0.64	0.55	1.08
Missouri	51.14	70.72	75.81	49.42	0.32	0.55	0.62	0.69
Arkansas-Red-White	37.30	51.32	54.76	60.67	0.29	0.58	0.64	0.75
Texas Gulf	35.61	49.54	44.87	59.97	0.08	0.13	0.14	0.15
Rio Grande	32.35	44.28	48.71	56.20	1.42	1.22	1.15	1.31
Upper Colorado	52.54	71.41	75.25	80.32	0.42	0.55	0.76	1.39
Lower Colorado	34.21	47.45	53.34	69.11	1.22	2.20	3.21	3.54
Great Basin	56.83	78.14	83.44	90.20	1.42	1.67	1.42	1.33
Columbia-North Pacific	119.52	171.42	192.14	216.31	1.79	2.57	1.97	1.59
California-South Pacific	51.10	69.54	NA	82.23	0.58	0.83	NA	1.53

Table B-13
Acres of Cropland Used for Various Levels of Erosion Reduction

Area	Cropland Used in Millions of Acres					Cropland Used as a Percent Change From Base			
	Base	10%	20%	30%	40%	10%	20%	30%	40%
U.S. Total	354.8	351.57	349.43	347.69	346.47	-0.9	-1.5	-2.0	-2.3
New England	1.46	1.46	1.46	1.45	1.45	0.0	0.0	-0.7	-0.7
Middle Atlantic	9.30	9.30	9.24	9.29	9.28	0.0	-0.6	-0.1	-0.2
South Atlantic Gulf	20.89	20.85	20.71	20.65	21.00	-0.2	-0.9	-1.1	0.5
Great Lakes	22.73	22.62	22.56	22.48	22.31	-0.5	-0.7	-1.1	-1.8
Ohio	29.13	20.13	29.13	28.89	28.89	0.0	0.0	-0.8	-0.5
Tennessee	1.56	1.47	1.40	1.40	1.39	-5.8	-10.3	-10.3	-10.9
Upper Mississippi	60.85	60.93	60.90	60.73	60.90	0.1	0.1	-0.2	0.1
Lower Mississippi	19.81	19.62	19.36	19.07	17.97	-0.6	-2.3	-3.7	-9.3
Souris-Red-Rany	18.71	18.36	18.35	18.51	18.43	-1.8	-1.9	-1.1	-1.5
Missouri	85.57	84.80	84.46	84.36	84.05	-0.9	-1.3	-1.4	-1.8
Arkansas-Red-White	39.36	39.11	39.19	38.74	38.69	-0.6	-0.4	-1.6	-1.7
Texas Gulf	16.48	15.78	15.10	15.12	15.87	-4.2	-8.4	-8.3	-3.7
Rio Grande	1.55	1.44	1.39	1.39	1.22	-7.1	-10.3	-10.3	-21.3
Upper Colorado	0.81	0.74	0.70	0.72	7.03	-8.6	-13.6	-11.1	NA
Lower Colorado	1.04	1.03	0.96	0.91	0.90	-1.3	-7.7	-12.5	-13.5
Great Basin	1.46	1.50	1.49	1.44	1.42	2.7	2.1	-1.4	-2.7
Columbia-North Pacific	15.87	15.66	15.54	15.33	15.11	-1.3	-2.1	-3.4	-4.8
California-South Pacific	8.21	7.78	7.48	7.76	5.79	-5.2	-8.9	-5.5	-17.2

Table B-14.--Cost of controlling salinity

Area	Acres Irrigated 1/	Percent of land Potentially Treated	Treated Acres	Cost per Acre	Total Cost
					Million
Upper Colorado	1,365,000	80%		$276 (a)	$301.39
Lower Colorado	1,283,000	80%		$242 (b)	248.39
Rio Grande	1,984,000	80%		$276 (a)	438.07
Great Basin	1,739,000	80%		$482 (c)	531.74
California-South Pacific	8,729,000	80%		$242 (b)	1,689.93

1/ 1975 National Water Assessment

(a) Based on alternative #1 On Farm Salinity Control-Fainal Report of the Grand Valley Salinity Study - USDA-SCS, 1977.

(b) Based on Actual Costs incurred in the Wellton-Mohawk Project - Arizona.

(c) Unitah Basin Salinity Study - USDA Report - Draft, 1978.

Table B-15.--Sedimentation of reservoirs

Area	Total No. of Reservoirs	Average Annual Sediment Yield Per Reservoir Tons/Mile^2
New England	5	114.0
Middle Atlantic	11	547.2
South Atlantic Gulf	21	1,226.4
Great Lakes	35	820.5
Ohio	21	1,284.8
Tennessee	7	442.0
Upper Mississippi	42	1,861.6
Lower Mississippi	15	3,675.5
Souris-Red-Rany	6	53.8
Missouri	17	460.7
Arkansas-Red-White	27	778.7
Texas Gulf	30	1,594.7
Rio Grande	13	1,227.2
Upper Colorado	0	0
Lower Colorado	13	861.8
Great Basin	14	694.0
Columbia-North Pacific	19	673.3
California-South Pacific	21	499.3

*U.S. GOVERNMENT PRINTING OFFICE: 1979 O-624-025/923